

A STUDY ON PATHACHAKKARAM

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INTRODUCTION

Siddha system is one of the Ancient systems of medicine in India. The system has been developed with philosophy or “Thathuvam” as its base. Siddhars had given equal importance to “Vedantha” and “Siddhantha”. This could be known by Thayumanavar’s Lines which says,

***“வேதாந்த சித்தாந்த சமரச நன்னிலை பெற்ற
வித்தகச் சித்தர் கணமே”***

The Siddha system flourished in south, Ayurvedha in north. The origin of the Siddha system and the usage of medicinal plants belongs to the age of the sangam literatures as early as 3000 B.C. Tholkappiam and Thirumanthiram stand as a proof to this. It believes that all subjects in the universe are composed of 5 basic elements (Pancha boothangal) namely Earth, Water, Fire, Air and Sky. The diet is considered to be the basic building material.

Siddhars had written their works on subjects, namely.

- ❖ Alchemy (Rasavadham)
- ❖ Medicine (Maruthuvam)
- ❖ Surgery (Aruvai maruthuvam)
- ❖ Asanam (Yoga)
- ❖ Philosophy (Gnanam)

They had also strictly emphasized on hygienic principles which were neatly quoted in “Padarthaguna sinthamani”. With regard to Ivagai nilam, Kalam, and Pozhuthu. According to this system “Mukkuttram” is considerable to be responsible for any disease.

Disease is classified as,

- i. Disease involves gross body (Udarpini)*
- ii. Disease involving subtle body (Manapini).*

In siddha system the diseases are classified broadly as 4,448 diseases by siddhars , based on the “Tridoshic theory”

Aetiology (or) the cause for any disease is said to be diet and day today activities. According to Thanvantri Vaithiyam “PATHACHAKKARAM” – பாதச்சக்கரம் Comes under the 9 types of Patha rogangal.

The author of this dissertation work has selected “PATHACHAKKARAM” – one of the complications of the disease “Madhumegam”. Improper treatment or improper diet of a madhumegam patients leads to form “PATHACHAKKARAM”.

The word “Madhumegam” in Siddha terms correlates with that of “Diabetes mellitus” in modern terms.

*Twenty varieties according to the nature of urine have “ been described in the ancient siddha texts under the subject “**meha Neer**”. Depending upon, which of the three body humours is deranged four varieties by Vali, six due to Azhal, and ten due to Iyam. One among in Azhal is called Madhumegam (honey-Urine) or Kshaudra meham in Ayurvedha. Shushrutha (600 BC) classified in to two, one congenital and the other is due to impudicity feeding and irregular way of living.*

SIDDHA - PHYSIOLOGY

The science of the functions of the living organisms, its compounds, the physical and chemical factors and processes involved is known as physiology.

"சென்ம மர்ச்சரீம் தொண்ணூற்றாறு அங்குலமாம்

செய்கின்ற அவரவர்கள் கையாலே தான்"

- யுகிமுனி வைத்திய சிந்தாமணி - 800

The height of the human body is 96 inches or 8 saans of their own hands.

The siddha Physiology involves the basis of

<i>Thathuvas</i>	- '96' Basic elements
<i>Udal Kattugal</i>	- '7' Somatic compounds
<i>Vegams</i>	- '14' Reflexial functions
<i>Suvaigal</i>	- '6' tastes
<i>Udal Thee</i>	- '4' Body fires
<i>Udal Vanmai</i>	- '3' Immunities.

The living and non living things which are present both in the microcosm has 96 basic elements. These elements are responsible for the creation, protection and destruction of life which is mediated through the "Pancha Poothic" and "Mukkutra" theory.

According to the “Yugi Vaidhya Chinthamani and Sathaga Naadi

Nool” the 96 Thathuvas are explained as follows.

96 Basic Factors:

“உறுதியாம் பூதாதி யோரைந்தாம்
உயர்கின்ற பொறி ஐந்து புலனைந்தாகும்
கருதியாக் கண்ம விந்திரிய மைந்தும்
கடிதான ஞானவிந் திரியமைந்தும்
திருதியாந் தீதாய கரணம் நான்கும்
திறமான அறிவொன்று நாடிப்பத்தும்
மறுதியாம் வாயுவது பத்து மாகும்
மகத்தான வாசயமந் கேச மஞ்சே
அஞ்சவே யாதார மாறு மாகும்
அரிய மண்டல மூன்று மலம் மூன்றாகும்
தொஞ்சவே தேட மூன்றீடனை மூன்றோ
றோதகமாய் குணமூன்று வினை யிரண்டாம்
தஞ்சவே ராக மெட்டவத்தை யைந்து
தயங்கிய தேர் கருவி காடான் தொண்ணூற்றாறு
ஒஞ்சவே யொவ்வொன்றாய் விரித்துச் சொல்வேன்
உறுதியாம் பூதாதி யுரைக்கக் கேளே.”

- சித்தமருந்துவாங்க சுருக்கம்.

<i>Pootham</i>	- 5	<i>Naadi</i>	- 10	<i>Dosham</i>	- 3
<i>Pori</i>	- 5	<i>Vayu</i>	- 10	<i>Edanai</i>	- 3
<i>Pulan</i>	- 5	<i>Aasayam</i>	- 5	<i>Gunam</i>	- 3
<i>Kanmendhiryam</i>	- 5	<i>Kosam</i>	- 5	<i>Vinai</i>	- 2
<i>Gnanendhriyam</i>	- 5	<i>Aatharam</i>	- 6	<i>Raagam</i>	- 8
<i>Karanam</i>	- 4	<i>Mandalam</i>	- 3	<i>Avathai</i>	- 5
<i>Arivu</i>	- 1	<i>Malam</i>	- 3		

Pancha Pootham – five basic elements

The fundamental principle of siddha science involves the five basic elements namely.

1. *Mann* - *Earth*
2. *Neer* - *Water*
3. *Thee* - *Fire*
4. *Vayu* - *Air*
5. *Aagayam* - *Eather*

*As per the siddha concepts, not only the universe but also the human body is formed by the above mentioned “**Five Poothas**”.*

It is well explained by “Sattamuni” as

"அண்டத்திலுள்ளதே பிண்டம்

பிண்டத்திலுள்ளதே அண்டம்"

Moreover any changes that occur in the universe has its impair also in the body.

According to “Sathaga Naadi Nool” the Panchapoothic parts of human body are explain as follows:

"பாரப்பா பூதமைந்து மண், நீந்தேயு

பரிவாயு வாகாய மைந்தினாலே

சேரப்பா சடமாச்சு மண்ணின் கூறு

செறிமயிர் தேரல் என் பிறைச்சி நாம் பைந்தாகும்

நேரப்பா அப்புவின் கூறுதிரமச்சை

நீர்முனை சுக்கில மோடைந்தாகும்

காரப்பா தேயு கூறு பயமாங்காரம்

கடும் சோம்பல் நிந்திரை மைதுனங்களஞ்சே

அஞ்சான வாயுவின் கூறுருத்தல் லோடல்

அனை நடத்தல் கிடத்தலுடன் நிற்றலஞ்சாம்

அஞ்சாரு மாகாயக் கூறு காமம்

அதிசூரோத லோப மத மோக மஞ்சாம்".

Table No: 1

S.No.	Pancha Pootham	Panchapootha and Human Constitution
1.	<i>Mann</i>	<i>Hair, skin, Bone, muscle and Nerve</i>
2.	<i>Neer</i>	<i>Blood, Bone marrow, Body fluids Brain and Sperm.</i>
3.	<i>Thee</i>	<i>Fearness, Anger, Idleness, Sleeping and sexual intercourse.</i>
4.	<i>Vayu</i>	<i>Sitting, standing, waking, running and lying</i>
5.	<i>Aagayam</i>	<i>Sex, Hardeners, stingyness, lust and pride.</i>

2. Five sense organs (Porigal)

1. *Skin*

2. *Tongue*

3. *Eye*

4. *Nose*

5. *Ear*

3. The five object of sense (Pulankal)

1. *Touch*

2. *Taste*

3. *Vision*

4. *Smell*

5. *Auditory*

4. The five organs of action (Kanmaenthrium)

- 1. Hands*
- 2. Legs*
- 3. Mouth*
- 4. Anus*
- 5. Genitalia*

5. The five organ of perception (Gnanaenthrium)

- 1. Speech*
- 2. Flexion and extension of Lower limb*
- 3. Flexion and extension of Upper limb*
- 4. Motion voided*
- 5. Semen / ovum voided.*

6. The four Intellectual Faculties (Karanam)

- 1. Mind*
- 2. Research*
- 3. Action*
- 4. Finalizing*

7. The Ten nerves (Naadi)

1. *Idakalai* - From right big toe runs opposite side to the left nostril.
2. *Pinkalai* - From left big toe, runs opposite side to the right nostril.
3. *Suzumunai* - Passes through both nostrils.
4. *Sikuvai* - For swallowing of food and water in the uvula.
5. *Puruden* - It locates at right eye
6. *Kanthari* - It locates at left eye
7. *Atthi* - It locates at right ear
8. *Alambudai* - It locates at left ear
9. *Sangini* - Vagina or tip of the penis
10. *Kuru* - It locates Anus.

8. Vayu - Ten vital air forces

1. *Pranan*
2. *Udhanan*
3. *Vyanan*
4. *Abanan*
5. *Samanan*
6. *Nagan*

7. *Koorman*

8. *Kirukaran*

9. *Devadhathan*

10. *Dhananjeyan*

9. Aasayam - Five visceral cavities

1. *Amarvasayam* - *Stomach*
2. *Pahirvasayam* - *Liver, small intestine*
3. *Malavasayam* - *Rectum, large intestine*
4. *Salavasayam* - *Urinary bladder*
5. *Sukkila vasayam* - *Seminal vesicles (or) ovary*

10. Kosam

1. *Annamayakosam* - *Made up of seven udal thathukkal*
2. *Pranamayakosam* - *Conjunctions of pranan and
Kanmenthiriyam*
3. *Manomayakosam* - *Conjunction of manam and
Gnanenthiriyam*
4. *Vingnanamayakosam* - *Conjunction of Suzhuthi and
Gnanenthiriyam*
5. *Anandha maya kosam* - *Conjunction of Pranan and
Suzhuthi.*

11. Six stations of the soul (Aatharam)

1. Moolathaaram

It is a place of Kundalini a vital force.

2. Swathitanam

It is the place of earth

3. Manipooragam

It is the place of water.

4. Anaagatham

It is the place of fire.

5. Vishuthi

It is the place of air.

6. Aakinai

It is the place of space.

12. Mandalam

1. Agni mandalam - The area between mooladharam and naabhi kamalam.
2. Gnayiru mandalam - The area between the chest and the neck
3. Thingal mandalam - The central area of the skull.

13. Malam

The three principles of moral exits

1. Motion
2. Urine
3. Sweat

14. Three humours (Thodam)

The physiological functions of the body are mediated by this three humours which made up to five elements. These three functional factors maintain the integrity of the human body.

These are

1. Vali - 10 types
2. Azhal - 5 types
3. Iyam - 5 types

Vali

The term Vali denotes vayu, pain, dryness and flatulence, vatham and responsible for expiration and control of all movements.

Locations

Abanan, Faeces, Idakalai, Pelvic bone, Spermatic cord, Skin, Nerves, Joints, Hair and Muscles.

Character

It governs the other two basic elements and responsible for all physical process in general, for this reason, disturbance in Vali tend to have more severe complication than the other two humors and other attach the mind as well as entire physical body and also responsible for respiration.

Functions

Pain in the whole body, twitching, pricking pain, inflammation, reddish complexion, roughness of skin, hardness of limbs, astringent sense of taste in the mouth, constipation, oliguria, blackish discolouration of the skin, stool, urine and muddy conjunctiva.

Qualities Produced by Increased Vali

- 1. Vncious - Pasumai*
- 2. Hot - Akkini*
- 3. Solid - Katti*
- 4. Soft - Miruthu*
- 5. Stable - Sthiram*
- 6. Heavy - Paluvu*

Opposite Qualities That reduces the Increased Vali

- | | |
|-------------|----------------|
| 1. Dry | - Varatchi |
| 2. Cold | - Kulirchi |
| 3. Light | - Elesu |
| 4. Rough | - Kadinam |
| 5. Unstable | - Asaithal |
| 6. Subtle | - Anuththusvam |

AZHAL

Location

Pirana Vayu, Bladder, Moolagni, Heart, Unbilical region, Abdomen, Sweating, Saliva, Blood, Eyes and Skin.

Characters

It gives digestion, hear, visual perception, hunger, thirst, luster, complexion, understanding, intelligence, courage and softness of the body.

Functions

Acidity, burning sensation in the thorax, yellowish discolouration of the skin, eye, urine, sense of defaecation, profuse sweating and dizziness.

Qualities		Opposite Qualities	
<i>Hot</i>	- <i>Akkini</i>	<i>Cold</i>	- <i>Kulirchi</i>
<i>Mobile</i>	- <i>Oodurval</i>	<i>Immobile</i>	- <i>Nilaithalinmai</i>
<i>Acute</i>	- <i>Kururam</i>	<i>Harmless</i>	- <i>Santham</i>
<i>Liquid</i>	- <i>Salaroopam</i>	<i>Solid</i>	- <i>Katti</i>
<i>Sour</i>	- <i>Pulippu</i>	<i>Sweet</i>	- <i>Inippu</i>
<i>Pungent</i>	- <i>Kaaram</i>	<i>Bitter</i>	- <i>Kaippu</i>

IYAM

Iyam is life representation of Appu and Mann Pootham. It is responsible for maintenance of body structure and also responsible for the defence mechanism.

Location

Samanan, Suzhumunai, Vinthu, Head, Fat, Bone narrow, Blood, Nose, Colon, Joints, Chest and Tongue.

Characters

It gives stability, lubrication, holding together of the joints, ability to cope with hunger, thirst, worry, etc.

Fair complexion, Itching, dullness, cold, heaviness, loss of sensation, and sweetness in mouth and indigestion etc.

Qualities

Opposite Qualities

- | | |
|-------------------------|------------------------|
| 1. Unctious - Eeram | 1. Hot - Veppam |
| 2. Sweet - Inippu | 2. Pungent - Kaaram |
| 3. Heavy - Paluvu | 3. Light - Lesu |
| 4. Cold - Kulirchi | 4. Dry - Varatchi |
| 5. Smooth - Miruthu | 5. Rough - Kodinam |
| 6. Stable - Asaivinmai | 6. Mobile - Asaithal |
| 7. Viscid - Valavaluppu | 7. Sandy - Kasakasappu |

15. Edanai - 3

- | | |
|--------------------|----------------------|
| 1. Porul Pattru | - Material bindings |
| 2. Puthalva pattru | - Offspring bindings |
| 3. Ulaga pattru | - Worldly bindings |

16. Two deeds (Vinai)

- | | |
|---------------|--------------|
| 1. Nal vinai | - Good deeds |
| 2. Thee vinai | - Bad deeds. |

17. Three cosmic Qualities (Gunam)

- | | |
|-------------------|--|
| 1. Sathuva Gunam | - Goodness (or) virtue |
| 2. Raasatha Gunam | - Manifestation of passion, pride,
courage, zeal etc. |
| 3. Thamatha Gunam | - Ignorance manifested in torpor, sleep,
lust, anger etc. |

18. Five states of consciousness (Avathai)

1. Nanavu - Weak fullness
2. Kanavu - Dream
3. Urakkam - Sleep
4. Perurakkam - Stupor
5. Uyirppadakkam - State of samathy

Seven Constituent Elements (Seven Udal Thathukkal)

The seven thathus are responsible for the entire structure of the body.

"இரசம் உதிரம் இறைச்சி தேரல் மேதை
மருவிய வத்தி வாழும் பொடு மச்சை
பரவிய சுக்கிலம் பாழாம் உபாதி
உருபம் லாலுடல் ஒன்றென லாமே"

- திருமந்திரம் 2086.

*Saaram, Senneer, Oon, Kozhuppu, Enbu, Moolai, and Sukkilam
(or) Suronitham.*

Functions of the udal thathukkal

1. Saaram

It strengthens the body and mind.

2. Senneer

It gives power, knowledge, and boldness to making

3. Oon:

It gives the structures and shape to the body and is responsible for the movement of the body.

4. Kozhuppu

It lubricates the joints and facilitates their functions.

5. Enbu

It forms skeleton of the body, protects, viscera's and concerned with body movement.

6. Moolai

It is present in the bones and gives strength.

7. Sukkilam (or) Suronitham

Mean for reproduction

14 - VEGANGAL – URGES

"பதினான்கு வேகப் பேர்கள்

பகர்ந்திட அவற்றைக் கேளாய்

லிதித்திடும் வாதம் தும்மல்

மேவுநீர் மலங்கொட் டாவி

கதித்திடு பசுநீர் வேட்கை

காசமோ டினைப்பு நித்திரை

மதித்திடு வாந்தி கண்ணீர்

வளர்கக்கிலஞ் சுவாசமாமே."

The 14 Reflexes are,

வாதம்	- Flatus	காசம்	- Cough
தும்மல்	- Sneezing	இளைப்பு	- Relaxation
சிறுநீர்	- Urine	நித்திரை	- Sleep
மலம்	- Faeces	வாந்தி	- Vomit
கொட்டாவி	- Yawning	கண்ணீர்	- Tear
பசி	- Hunger	சுக்கிலம்	- Semen
நீர்வேட்கை	- Thirst	சுவாசம்	- Breath

If we control (or) repress any one of the above 14 urges, it will create the diseases.

ARU SUVAIGAL

It is the peculiar sensation caused by the contact of soluble substances with the tongue. These must be taken in a correct proportion for healthy living since these have impact over the humours of the body.

Suvai are more related with the Udal Thathukkal and Uyir Thathukkal

Table - 2

<i>Suvai</i>	<i>Bootham</i>	<i>Increased Uyirthathu</i>
<i>Inippu (Sweat)</i>	<i>Water + Earth</i>	<i>Iyam</i>
<i>Pulippu (Sour)</i>	<i>Fire + Water</i>	<i>Azhal, Iyam</i>
<i>Uppu (Salt)</i>	<i>Fire + Earth</i>	<i>Azhal, Iyam</i>
<i>Kaippu (Pungent)</i>	<i>Ether + Ear</i>	<i>Vali</i>
<i>Kaarppu (Pingent)</i>	<i>Air + Fire</i>	<i>Vali, Azhal</i>
<i>Thuvarppu</i> <i>(Astringent)</i>	<i>Air + Earth</i>	<i>Vali, Iyam</i>

Udal Vanmai

Udal Vanmai is of three types, namely,

Iyarkai Vanmai

Seyarkai Vanmai

Kala Vanmai

Four Body Fires

1. Samakkini

Usual Routine activities of samana vayu are called “Samakkini”. It is concerned with proper digestion of food.

2. Vishamakkini

It delays digestion of ingested foods and facilitates indigestion.

3. Dheeksanakkini

It facilitates digestion of improperly cooked foods, ingested by individual.

4. Mandakkini

It delays digestion of food stuffs, ingested with satiety, favours, belching, flatulence, gurgling, and distention of abdomen.

SIDDHA PATHOLOGY

PATHOLOGY

The medical science and speciality practice that deals with all aspects of disease but with special reference to the essential nature. The cause and development of abnormal conditions as well as the structure and functional changes that result from the disease processes is termed as pathology.

BASICS OF SIDDHA PATHOLOGY

According to siddha pathology the human body is made of pancha boothams. These boothams are grown in body by food, mediated through the “Aru - suvaigal”. So that it is proved the “suvaigal” has got unique place in the body system.

The five basic elements are taking part in the body through “Uyir thathukkal.” These three types, of essential humours are formed by the combination of

<i>Idakalai</i>	+	<i>Abanan</i>	- <i>vali</i>
<i>Pinkalai</i>	+	<i>pranan</i>	- <i>Azhal</i>
<i>Suzhumunai</i>	+	<i>Samanan</i>	- <i>Iyam</i>

Functions of Uyir Thathukkal are,

<i>வாதமாய் படைத்து</i>	- <i>Creation</i>
<i>பித்த வன்னியாய் காத்து</i>	- <i>Protection</i>
<i>சேட்ப சீதமாய் துடைத்து</i>	- <i>Destruction</i>

These vali, Azhal, Iyam humours will be in the proportion of 1: 1/2: 1/4 respectively.

Uyirthathukkal is responsible for Udal Thathukkal

The above basic structures of the body system are interlinked with one another. These basic structures are affected by dietetic factors, physical activities, and environmental factors resulting the disease.

Noi – (Disease)

The disease is a disorder with a specific cause and recognizable signs and symptoms, and bodily abnormality or failure to function properly except that resulting directly from physical injury.

As per “Siddha Maruthuvanga Surukkam” it is defined as follows.

“உடலுடன் இணைந்த உயிர் அனுபவிக்கும் இன்ப உணர்ச்சிக்கு மறறான உணர்ச்சியே பிணியின் இலக்கணமாகும்”.

Classification of diseases

Siddhar’s have identified 4,448 diseases. They have classified the diseases mainly on the basis of three humors and its thontha states.

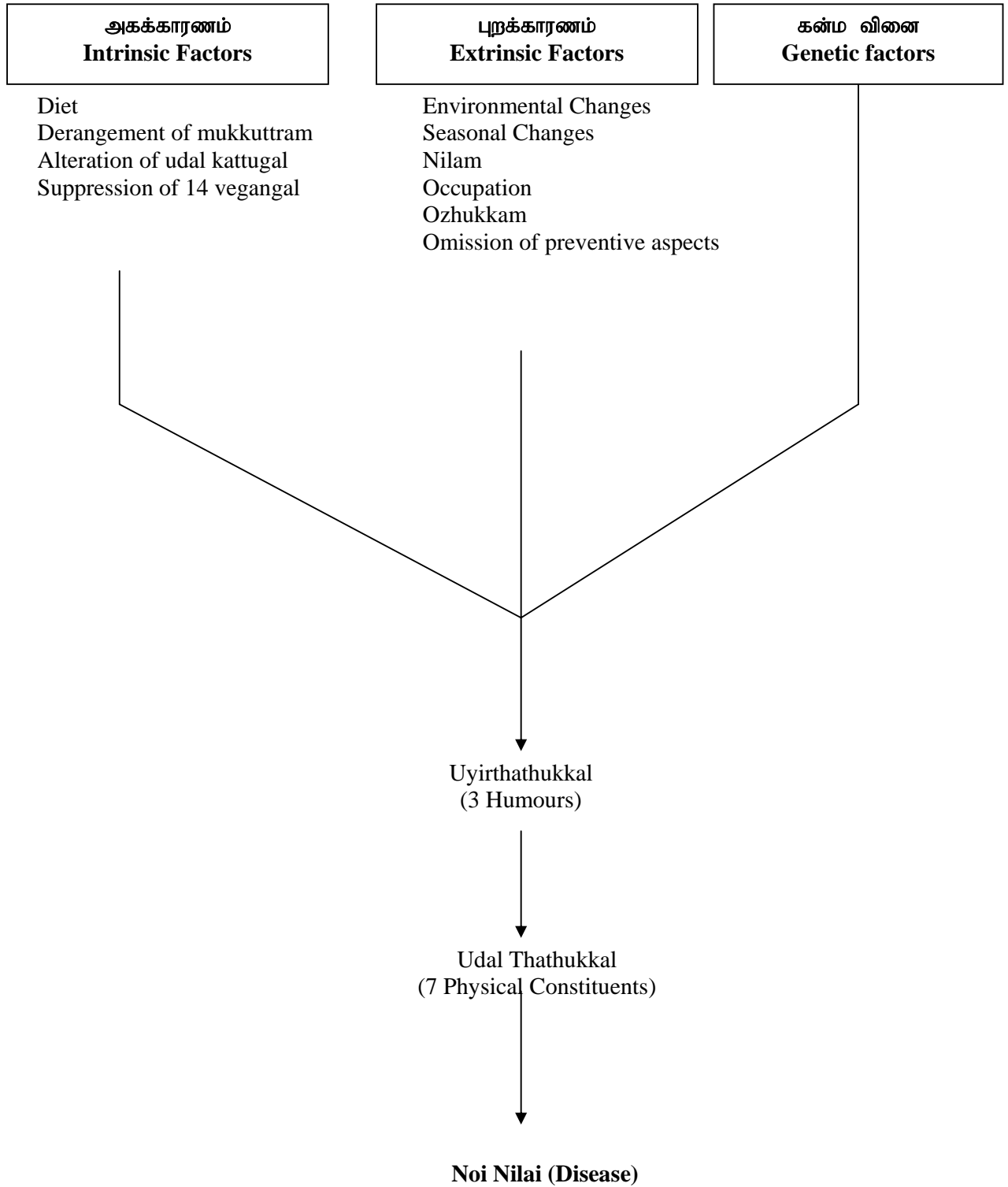
The diseases are diagnosed by the classical method of diagnosis called “Envagai thervugal” and other specific parameters which are explained in our siddha science.

General Aetiological factors

In siddha system of medicine, the common aetiological factors are generally explained in three ways.

- 1. Agakkaaranam - Intrinsic factors***
- 2. Purakkaaranam - Extrinsic factors***
- 3. Kanmam - Genetic factors***

THE SCHEMATIC DIAGRAM FOR THE FORMATION OF DISEASE



The changes in any one of the above basic structures, from the basis of pathology. This can be explained, briefly as follows.

அகக் காரணங்கள்- Intrinsic Factors

1. Diet - உணவாதி செயல்கள்

தொழில் புரிவதற்கு வேண்டிய சக்தியை கொடுக்கவும், உடலில் நிலை பெறச் செய்யவும், வளர்க்கவும் ஒருவர் புசிப்பதே உணவாகும். இவ்வகை உணவானது அறுசுவைகளால் ஆனது. இச்சுவைகள் பஞ்சபூத கூறுபாடுகளினால் உருவானது.

இவ்வுடலும் பஞ்சபூத கூறுபாடுகளினால் ஆனது என்பது சித்த மருத்துவ கருத்து, இவ்வாறு உணவானது தன் சுவைகளின் மூலம் பஞ்சபூதக் கூற்றுப்படி அமைந்த உயிர்தாதுக்களையும், உடல்தாதுக்களையும் வளர்த்து அதன் தன்னிலைக்கு காரணமாக அமைகிறது.

எனவே உணவில் ஏற்படும் மாற்றங்கள் உடலிலுள்ள உயிர், உடல்தாதுக்களை பாதித்து நோயை வருவிக்கிறது.

உணவில் அறுசுவையும் கலந்து இருக்கும் போது பாதிப்பை ஏற்படுத்துவதில்லை, ஏதாவது ஒரு சுவையை அதிகமாக உட்கொள்ளும் போது, கீழ்க்காணும் நோய்கள் ஏற்படும்.

1. Inippu (Sweet)

Increased Inippu suvai is responsible for obesity, indigestion, diabetes, cervical adenitis, increased Iyam and it's disease.

2. Pulippu (Sour)

Increased Pulippu suvai is responsible for body weakness, dull vision, giddiness, anaemia, dropsy, and feverishness, dryness of the tongue, herpes, scabies and blister.

3. Uppu (Salt)

Increased Uppu suvai is responsible for ageing, falling of hair and progressive weakness of the body.

4. Kaippu (Bitter)

Increased Kaippu suvai is related to Vali disorders of physical constituents.

5. Kaarppu

Increased Kaarppu suvai is related to excessive dryness of the tongue, defect in spermatogenesis, general malaise, lassitude, tremors and back pain.

6. Thuvarppu

Increased Thuvarppu suvai is related to abdominal discomfort, heart disease, tiredness, vascular constriction and constipation.

நாம் உணவினை உண்ணும் போது, ஏதாவது ஒரு சுவை அதிகப்படும்போது குற்றம் உண்டாகும். இதை கீழ்க்காணும் செய்யுளில் அறியலாம்.

"புனிதுவர் விஞ்சுங்கறி யாற்பூரிக்கும் வாதம்
ஒளியுவர் கைப்பேறில் பித்தஞ் சீறும் - கிளிமொழியே
கார்ப்பிணிப்பு விஞ்சிற் கபம் விஞ்சஞ் சட்டிரதச்
சேரப் புணர் நோயணுகாதே"

உயிர்தாதுக்கள் (முக்குற்ற வேறுபாடு)

It is of 3 types namely:

- ★ Vali
- ★ Azhal
- ★ Iyam

These Vazhi, Azhal, Iyam humours will be in the proportion of 1:1/2: 1/4 If there is any change (increase or decrease) from above, caused by aetiological factors. (Diet, physical activities, environmental factors etc.,) it will result the disease. This can be quoted in the following schedule.

Table - 3

Signs and Symptoms			
Quantitative	Vali	Azhal	Iyam
<i>Character</i>	<i>Wasting, blackish discolouration, tremors</i>	<i>Yellowish discoloration of eyes, skin</i>	<i>Loss of appetite, excessive salivation</i>
<i>Increased</i>	<i>Distended abdomen, constipation, weakness, Insomnia, Lack of Inspiration.</i>	<i>Polyphagia, burning, sensation all over the body, sleeplessness.</i>	<i>Diminished activity, heaviness, cough, dyspnoea, excessive sleep.</i>
<i>Decreased</i>	<i>Body pain, feeble voice, diminished capacity of brain, syncope.</i>	<i>Decreased appetite, symptoms associated with defective growth of Iyam.</i>	<i>Giddiness, dryness of the joints prominence of bones, dry cough, lightness, palpitation excessive sweating</i>

The human body is built up by the 7 Udal thathukkal which are present in certain fixed proportions in every body. If there is any change in the proportions the diseases will occur.

SAARAM

Increased Features

*Features identical to those encountered in increased Iyam occurs
eg: Loss of appetite.*

Decreased Features

- ❖ *Dryness of skin*
- ❖ *Loss of weight*
- ❖ *Tiredness*
- ❖ *Diminished activity of sense organs*

SENNEER

Increased features

- ❖ *Boil and tumours in different parts of the body.*
- ❖ *Splenomegaly, hypertension*
- ❖ *Reddish eye and skin*
- ❖ *Jaundice and haematuria*

Decreased Features:

- ❖ *Tiredness*
- ❖ *Dryness*
- ❖ *Lasstitude*
- ❖ *Anaemia*

OON

Increased Features

Tumours or extra growth around neck, face, abdomen, thigh, genitalia etc.,

Decreased features

- ❖ *Muscle wasting*
- ❖ *Lethargic of sense organs*

KOZHUPPU

Increased Features

Features of increased Oon, associated with dyspnoea on exertion.

Decreased Features

- ❖ *Joint pain*
- ❖ *Emaciation*

ENBU

Increased Features

Excessive ossification and dentition

Decreased Features

- ❖ *Weak bone, nails and teeth*
- ❖ *Associated with splitting of hairs, nails.*

MOOLAI

Increased Features

- ❖ *Heaviness of body*
- ❖ *Swollen of interphalangeal joints*
- ❖ *Oliguria*
- ❖ *Non healing ulcers*

Decreased Features

- ❖ *Osteoporosis and sunken eyes.*

SUKKILAM OR SURONITHAM

Increased Features

- ❖ *Increased sexual activity*
- ❖ *Urinary calculi.*

Decreased Features

- ❖ *Pain in the Genitalia accompanied by inability to reproduce.*

14 - VEGANKAL

The person who is trying to control or suppress the 14 vegams (reflexes) he will be affected by the following diseases.

Table - 4

<i>Vegams</i>	<i>Causing the diseases</i>
<i>1. Vatham</i>	<i>Chest pain, peptic ulcer, abdominal pain, body ache, constipation, oliguria, and indigestion.</i>
<i>2. Thummal</i>	<i>Headache, Facial pain, back pain, pain in the sense organs etc.</i>
<i>3. Siruneer</i>	<i>Ulcers in the urethral orifice, joints pain, urinary tract infection.</i>
<i>4. Malam</i>	<i>Calf muscle pain, headache, general debility, flatulence and other disease</i>
<i>5. Kottavi</i>	<i>Indigestion, contractures in the face.</i>
<i>6. Pasi,</i>	<i>Constipation, of the body is totally disturbed, emaciation.</i>
<i>7. Neervetkai</i>	<i>Constipation, of the body is totally disturbed, emaciation.</i>
<i>8. Kaasam</i>	<i>Chest disorders supervene.</i>
<i>9. Ilaippu (Rest)</i>	<i>Ulcer and other mega diseases.</i>
<i>10. Nithirai</i>	<i>Heaviness of the head, eye pain, deafness, speech disturbances.</i>
<i>11. Vaanthi</i>	<i>Utricaria, skin disease, toxic manifestations, anaemia, eye diseases.</i>
<i>12. Kanneer</i>	<i>Eye disease, head ache, sinusitis, and heart diseases.</i>
<i>13. Sukkilam</i>	<i>Joints pain, fever, chest pain, difficulty in micturition.</i>
<i>14. Swaasam</i>	<i>Cough, abdominal discomfort, anorexia.</i>

புறக்காரணங்கள் - Extrinsic Factors

Environmental Factors

"அண்டத்திலுள்ளதே பிண்டம்" - என சட்டமுனி கூறுவதால் அண்டத்தில் ஏற்படும் மாற்றங்கள் அனைத்தும் பிண்டத்தை பாதிக்கும் என்பது தெளிவாகிறது.

மனித சக்திகளும், உலக நிகழ்ச்சிகளுக்குக் காரணமாகிய சக்திகளும் ஒன்றுக்கொன்று தொடர்புடையவை, மனிதனுள் நிற்கும் சக்திகளாகிய முக்குணம், முக்குற்றம், உடற்கட்டுகள், கோசங்கள், ஆதாரம் முதலியவைகள் இயற்கைக்கு மாறாகச் செயல்படும்போது பிணிகள் உண்டாகின்றன.

இச்சக்திகளின் விளைவாய், வியட்டியில் அதாவது உலகத்தின் வான் நிலைகளில் மாற்றம் உண்டாகி, பூகம்பம், புயர்காற்று, பெருமழை, வெள்ளம், கடற்கோள், இவற்றினால் அழிவு ஆகியவை ஏற்படும்.

மனித உடலில் ஒரு சில உறுப்புகள் பிரபஞ்சத்தால் பரவி நிற்கும், சில தத்துவங்களின் பொதுவான சக்தியால் செயல்படுத்தப் படுகிறது.

அவ்வாறான உறுப்புகளில்,

தமரகம்	- சூரியன்
மூளை	- சந்திரன்
பித்தப்பை	- செவ்வாய்
நுரையீரல்	- புதன்
நீர்குண்டிக்காய்	- சூக்கிரன்
கல்லீரல்	- குரு
மண்ணீரல்	- சனி

எனவே சுற்றுச்சூழலில் ஏற்படும் மாறுபாடுகள், மனிதனுக்கு, நோயை விளைவிக்கிறது.

Nilam

வசிக்கும் இடங்களின் நீர் வளங்களும், காலங்களும், நோயை வருவிப்பதில் முக்கிய பங்கு வகிக்கின்றது. மனிதன் வசிக்கும் இடங்கள் ஐவகை திணைகளாக பிரிக்கப்பட்டு அவற்றில் ஏற்படும் நோய்களை பற்றி கூறியுள்ளனர், அவையாவன.

Kurinji - Fever, anaemia, Liver enlargement, iyaa disease, etc.

Mullai - Vali and Azhal diseases are predominant

Marudham - Favourable places for Living

Neidhal - Vali diseases, elephantiasis, Hepatomegaly

Palai - Abode of all ailments

Seasonal Changes

காலம் என்பது ஆறு பருவ காலங்களையும், ஆறு பொழுதுகளையும் குறிக்கும்.

பருவகாலங்களில் ஏற்படும் மாற்றங்களாவன.

Table 5

வ.எண்.	பருவகாலம்	முத்தாதுக்களின் நிலை
1.	கார்காலம்	வளி ↑↑ அழல் ↑
2.	கூதிர்காலம்	வளி -- ஐயம் ↑↑
3.	முன்பனி	வளி -- அழல் -- ஐயம் --
4.	பின்பனி	ஐயம் ↑
5.	இளவேனில்	ஐயம் ↑
6.	முதுவேனில்	வளி ↑ ஐயம் -

↑ - தன்னிலை வளர்ச்சி
 ↑↑ - வேற்றுநிலை வளர்ச்சி
 — - தன்னிலை அடைதல்

OZHUKKAM

In this modern world, there is a wide opportunity for the human to derail from the disciplined path. It is caused dreadful diseases to enter into the man.

Omission of Preventive aspects

நமது மருத்துவத்தில் கூறப்பட்ட ஒழுக்கங்களை கடைபிடிக்க தவறும் போது நோய் உண்டாகிறது.

பிணி அணுகா விதி:

"திண்ணை மிரண்டுள்ளே சிக்க வடக்காமாற்

பெண்ணின்பா லொன்றைப் பெருக்காமல் - உண்ணுங்கால்

நீர்கருக்கி மேர் பெருக்கி நெய்யுரக்கி யூண்பார்தம்

பேருரைக்கிற் போமே பிணி".

"பாலுண்போம்: எண்ணைய் - பெறின் இளவெந்நீர் குளிப்போம்:

பகற்புணரோம்: பகற்றுயிலோம்: பாயோதரமு மூத்த

ஏலஞ்சேர் சூழலியரோ முளவெயிலும் விரும்போது

இரண்டடக்கோம்: ஒன்றை விடோம்: இடதுகையிற் படுப்போம்

மூலஞ்சேர் கறி நுகரோம், மூத்த - தயிர் உண்போம்:

முதனாளிற் சமைத்தகறி யமுதெனானு மருந்தோம்:

ஞாலத்தான் வந்திழனும் பசித்தொழில் வுண்ணோம்

நமனார்க்கிங் கேதுகணு நாமிருக்கு மிடத்தே"

III Kanman – Genetic factor

Kanmavinai mentioned as an important cause for disease.

"கண்மத்தால் வந்தவினை தீரவிட்டால்
காயமொழிந்தே பிறக்குங் கண்ம நோய் வருகும்
சென்மத்தில் விந்துவிட்டுச் செனித்தவுடன் வருகும்
சீக்கிரமாய் நிவர்த்தி செய்து தீட்சை செய்வாய்
பண்மத்தில் துன்மார்க்கப் பாவங்கள் தானுலை
பாரமற் பொருளறியார் பாழ்வினைக் கீடாவார்
கண்மத்தை நிவர்த்தி செய்யக் கடுகக் கேளு
கனத்த தயாநிதி கிடைத்தால் தடுகாது நோயே".

- தேரன் வைத்தியம் தரு

GENERAL CAUSES FOR DISEASE

According to "Theran Karisal"

"நோயினுற் பத்திகேள் நோன்மைகூர் மைந்தனே
நோயாளி யென்பதறு நோயளி முன்னே
நோய்கள் வினை காதரமு நோய்கள் வரவேது
நோனாமை யால் வெகுளி நோனாத பசியால்
நோனாத நீர்படுகல் நோனாத உணவால்
நோக்கமரு ணமதாக நோக்கியொழி தொழிலால்
நோக்கென நடமாடி நோக்கி நடமிடலாம்
நோட்டக்காரரி நாடி நோட்டமொழி குரலால்
நோலியர் மாரொடு நோவ மருவுதலால்
நோன்பு விரதாதி பல நோய்கவரு மெலிவால்
நோஞ்சையென வனுகுணவு நோவு வயிறுதலால்
நோண்டவரிதென வேரை நோண்டியே ருதலால்

நோனாத வீரமடி நோனவணி குதலால்

நோய்களுர் பித்திவரு நோய்கள் வினை விதையாய்

நோய்கள் வினை வயலாய் மெய் நோய்கள் வளர்பயிராய்

நோயுதவு பலனாது நோய்கள் வெகு மேலாம்

நோதக வுரைத்தனமிந் நோய்களை மேலே

நோயினில் லாளர் நோன்மையி:திணியே”

- தேரன் கரிசல்

1. Kanma vinai

2. Dietic factor

3. Hat redness with other things

4. Emotion and excitement

5. Starvation and fasting

6. Improper intake of water

7. Directly seeing the sun with naked eye

8. Always speaking with high pitched tone

9. Sexual contact with diseased lady

10. Idleness

11. Psycho somatic problems

12. Wearing wet cloths

13. Complications of diseases.

“பிணிகளின் முதற் காரணம்”

“வாதமலாது மேனிகெடாது - வளர்பித்தத்
தீதலாது சத்தியடாது - சேத்துமத்தின்
கோதமலாது விக்கலெடாது - குடந்தண்ணில்
சீதமலாது சுரமும் வராது - தீதமாமே.”

“மந்தமலாது வாயு வராது - அனிலபித்தத்
தொந்தமலாது மூலம் வராது - தொடர் வாத
பந்தமலாது குன்மம் வராது - பகர்பித்த
விந்தையலாது மேகம் வராது - தீரமாமே.”

“அரசீரணயின்றிச் சுரம் வராது - திரிதோடக்
காரணயின்றிச் சந்தி வராது - கபமன
நீர்துவயின்றிச் சோபை வராது - நெடுவாதச்
சுர்வதுமன்றிச் சூலைவராது - வராதே.”

“அபத்தியயின்றித் தோடலிகாரமு - மணுகாது
அபத்தியமன்றி ஒளடதீனீமு - மணுகாது
கபத்தினையன்றிக் கரச சுவரசங் - காணாது
கபத்தினையன்றி வியர்வை குளிர்ச்சி - வராதே.”

- தேரையர்

மேலும்

“மிகினும் குறையினும் நோய் செய்யும் நூலோர்
வனமுதலா எண்ணிய மூன்று”.

- திருக்குறள்

If there is any changes (increased or decreased) in the basic structure mentioned in the basic of siddha pathology, resulting in disease.

This is quoted in the above “Thirukural”

PINIYARI MURAIMAI – DIAGNOSIS

Pini yari muraimai means method of finding out the diseases. The following three words are combined to form this word piniyarimuraimai.

Piniyari Muraimai - ***Pini + Yari + Muraimai***

Pini Means - *The disease which catch the body*

Yari means - *Identifying the diseases*

Muraimai means - *Rules and methods*

As per siddha literature, the diagnosis is based upon three main principles.

1. Poriyal arithal

2. Pulanal arithal

3. Vinaathal

Poriyalarithal and pulanal arithal

Poriyal means five organs of perception pulanal means five objects of the sense organs.

<i>Porigal</i>		<i>Pulanal</i>
<i>1. Nose</i>	-	<i>Smell</i>
<i>2. Tongue</i>	-	<i>Taste</i>
<i>3. Eyes</i>	-	<i>Vision</i>
<i>4. Skin</i>	-	<i>Touch</i>
<i>5. Ear</i>	-	<i>Sound</i>

The application of poriyalarithal and pulanalarithal form the fundamental step in the diagnosis of a disease.

Vinaathal

It is asking questions concerned with the history of disease, and its clinical symptoms etc., to the patient (or) asking to his neighbour, when the patient is not able to speak, or the patient to be a child. These three principles are affected through the Envagai thervugal.

ENVAGAI THERVUGAL

Envagai thervugal are having a broad and important role in diagnosing the particular disease, It is very much needed to have a through knowledge in it. According to siddha medical science without having knowledge in envagai thervugal, we can't diagnose the diseases.

“Theriyar” mentions the Envagai thervugal as follows.

“மெய்க்குறி நிறம் தொனி விழி நாவிருமலம் கைக்குறி”

According to the “Noi - naadal” the eight types of Investigations are Quoted as below.

**“நாடிப் பறிசம் நாநிறம் மொழி- விழி
மலம் முத்திரமிவை மருத்துவ ராயுதம்”**

1. Naadi - Pulse
2. Sparisam - Palpation
3. Naa - Tongue
4. Niram - Colour
5. Mozhi - Speech

6. *Vizhi* - Eye
7. *Malam* - Motion
8. *Moothiram* - Urine

1. Naadi (signs in hand pulse)

Is nothing but the vital energy that sustains the life in our body. It has been considered for assessing the prognosis and diagnosis of the disease. Any variation that occurs in the three humours is reflected in the naadi. It serves as a good indicator of all ill health. It can be perceived by feeling it at the appropriate sites.

2. Sparisam

Reveals that the structural and sensational changes present through the body.

eg:

- ❖ *Skin temperature (Heat or cold)*
- ❖ *Sweat*
- ❖ *Dryness*
- ❖ *Tenderness*
- ❖ *Swellings*
- ❖ *Nourishment etc.,*

3. Naa (Tongue)

It reveals that structural changes, colour changes in the tongue, any ulceration, deviation etc.,

4. Niram (Colour)

It reveals that any change in the colour of the skin, nails, hairs, conjunctiva teeth, mucous membrane. Etc.

5. Mozhi (Sound and speech variation)

It reveals that means the quality of sound the made of speech, and intelligence is to be assessed.

6. Vizhi (Eye)

It reveals that the systemic changes in the organs, by changes in its colour, structure of the eye and any discharge in the eye. It is also reveals the function of the eye.

7. Malam (faeces)

The colour, amount, and consistency of the faeces will reflect the pathological condition of the body.

8. Moothiram (Urine)

Urine is a fluid excreted by the kidney, which contains many of the body's metabolic end products, In modern aspect, biochemical analysis of urine is commonly used in the diagnosis of the diseases and in pregnancy test.

நீர்க்குறி சிறப்பு

In siddha system of medicine examination of urine by neerkuri and neikkuri are more useful to diagnose the disease.

"தர்க்க சாத்திரி களானோர்
தங்களில் தேர்ந்து நாடி
வர்க்கமாம் நாடி தன்னில்
வடுவது மயக்கமென்றே
உற்றநீர்ப் பரீட்சை ஆய்ந்தே
உரைத்தனர் இதற்கு நேராய்
மற்றொரு விதிநூல் இல்லை
மருத்துவக் கலை வல்லோர்க்கே"

பொருள்:

மருத்துவக்கலை வல்லவர்க்கு, நோயை கணிப்பதற்கு நீர்க்குறியை காட்டிலும் சிறந்த முறை வேறில்லை எனலாம்.

Collection of urine for Neerkuri and Neikkuri

"அருந்து மாறி ரதமும் அவிரோதமாய்
அ.:கல் அலர்தல் அகலாவுன் தவிர்ந்தழற்
குற்றளவருந்தி உறங்கி வைகறை
ஆடிக் கலசத் தாலியே காதுபெய்
தொரு முகூர்த்தக் கலைக்குட்பட்டு நீரின்
நேர்க்குறி நெய்க்குறி நிருமித்தல் கடனே"

- தேரையர்

Prior to the day of urine, examination, the patient should be advised to take a balanced diet and should have good rest. The very first

urine of the patient is collected in a glass or a porcelain container. Through the urine should be examined only according to the rules and regulations, at times of emergency they can be relaxed which is quoted as,

"அருப்ப முற்றார்க் கவ்விதி விலக்கே"

Neerkuri

"வத்த நீர்க்கரி எடை மணம் நுரை எஞ்சலென்"

றைந்தியலுளவை யறைகுது முறையே"

Colour, quantity, odour, frothy appearance constituents, specific gravity of urine. Are physical findings.

1. Niram

It indicates the colour of urine, voided it may be yellow, red, green, black, crystal and smoky etc.

2. Edai

It indicates the specific gravity of urine (increased (or) decreased quantity)

3. Manam

It indicates the smell of urine, such as pleasant, foul smelling, honey smell, fruit smell, and fish smell.

4. Nurai

It indicates the frothy nature of urine

5. Enjal

It indicates the inorganic and organic deposits like salts, crystals, etc, and amount of urine extracted.

Neikuri

"பிணியுள்ளோர் நீரையேற்றுப் பொழுதுமுன் வைத்த பின்னர்

துணிவறு துரும்பி வெண்ணைய் தேய்த்தோடு துளியே விட்டால்"

அணுகி நீர்ப் பரம்பில் காணின் அதில்நேய் வட்டமாயின்

தணிவலகப் பித்த நோயாந் தங்குமுத் தைய நோயே".

A drop of gingili oil is dropped in to the centre of a upper surface of the urine, if the oil spreads like snake indicates Vali, spreads like ring indicates Azhal, remains floating as a pearl indicates Iyam, mixed reaction of any two indicates thontham.

Basically siddha aims to maintain the equilibrium, between the five elements deposit our constant interaction with the outer world.

The five elements, which work as and vital forces in the body and perform all physical and mental functions are constantly affected by time space and nutrition.

AIM AND OBJECTIVES

The author had selected the disease “PATHACHAKKARAM” for dissertation work, because,

“Pathachakkaram” is a complication of Madhumegam (Diabetes mellitus). The diabetes mellitus is an outstanding problem facing the world nowadays affecting the both rich and poor societies. The rate, of complication like diabetic foot is a guilt dread, of disability, long stretches of hospitalization, mounting impossible expenses, with the ever changing end result of on amputation. This makes the diabetic foot the most feared and devastating complication of diabetes.

Aim

To study the disease on the basis of Siddha physiology and Siddha pathology, emphasizing more importance to Mukkutram, Suvaigal, Panja bootha theory, Udal thathukkal and diagnose the patient on the basis of envagai thervugal and confirm the prognosis on the basis of “Neikuri”

Objectives

- ❖ *To fullfil the aim the following objectives has been drawn.*
- ❖ *To collect all Literary evidences about Patha rogangal diseases in detail*
- ❖ *Aetiology, and Clinical presentation of the disease*

- ❖ *Pathology of the disease*
- ❖ *Changes in the Mukkutram*
- ❖ *To study in detail about the incidence of the disease with age, sex, socio – economic status, habits and prevalence.*
- ❖ *To bring forth the high lights of Siddha system of diagnosis, Envagai thervu and modern aspects.*
- ❖ *To confirm the diagnosis in Siddha system with the help of modern parameters.*
- ❖ *The complication of the diseases is also dealt with.*

ELUCIDATION ABOUT PATHACHAKKARAM

"காணுதற்கு மரிய திமி ரெரிப்பு முண்டாய்க்

கனத்து வலித் திடுகிலிவை யுள்ளடி வாதந்தான்

சேனெரியு மக்கி விதர் போலத் தோன்றித்

தினவாகி நீர் பாய்ந்து செம்புண்ணாகித்

தோனு மெனி லிவை பாதச் சக்கரத்தின்

றொகுதி யெனவே முனிவன் சொன்னவாரே."

- தன்வந்திரி வைத்தியம் II ம் பாகம்

பாதச் சக்கரம் - பாதத்தில் வரும் ஒரு வகை விரணம் - A kind of
festering sore in the foot.

திமிர் - உணர்ச்சியின்மை, விறைப்பு, மரத்துப் போதல் -
Numbness

எரிப்பு - எரித்தல், அழற்சி - Burning Sensations

கனம் - தடித்தல், பாரம் கொள்ளல் -Heaviness

வலி - Pain

உள்ளடி - உள்ளங்கால் - Plantor region

சேனெரி - அகலமான - Increased in size

அக்கி - நோய் -Callus

விதர் (விதரம்) - பிளப்பு, வெடிப்பு - Fissure

தினவு - சொறிவு - Itching

நீர்பாய்தல் - Whoozing

செம்புண் - Erythematous ulcer

பாதம் - காலின் அடிப்பகுதி - Plantor region

சக்கரம் - வட்டம்

➤ The features of peripheral neuropathy are mentioned in the first 2 lines of the poem.

They are,

❖ Numbness, which is different from normal person.

❖ Burning sensation in the foot.

❖ Heaviness in the foot.

❖ Pain in the foot.

➤ The formation of ulcer is described in next two lines of the poem.

❖ They are callus formation.

❖ Fissure in the callus.

❖ Itching and oozing from the ulcer,

❖ Then the ulcer become reddish in appearance.

DETAILED PATHOLOGICAL VIEW OF DISSERTATION TOPIC

SIDDHA VIEW

As per Siddha system, our human body works under the principle of 96 Basic principles, any disturbances in the harmony of this 96 principles leads to changes in the homeostatic mechanism of 3 humours and 7 Udal Kattugal and leads to disease.

*Pathachakkaram, one among the 9 types of patha diseases as given in the **Patharoga Nithaanam**, taken from the **Thanvanthri vaithiyam**.*

Part-II.

"உள்ளடியி லேதானு முதித்திடும் நோ
யொருபதின்பே ருரைத்திடுவ னுலகு தன்னிற்
கள்ளயில்லா வுள்ளடியில் வாதம் பாதச்
சக்கரம் காற்காத்தல் கரிவாத குட்டம்
வள்ளலே கரும்புற்றுத் தசைப் புற்றென்ன
மருவிய செங்குரு வாதச்சூலை பாதெரிப்பு
மெள்ளலே யிவ்வகையாம் நோயின் பேர் தன்னை
விரித்து மிக மருத்து முனி விளம்புங் காணே."

- Thanvanthri vaithiyam –II part.

9 Patha disease are,

பாதச் சக்கரம்

கரிவாகுட்டம்

காற் காந்தல்

கரும்புற்று

தசைப்புற்று

செங்குரு

பாத சூலை

பாதெரிப்பு

பதகரி

Each patha diseases and their symptoms are being illustrated by the author in separate poems.

Pathachakkaram is a complication of Madhu megam (Diabetes mellitus)

Basic etiology of Mega noi is

"பகர் பித்த விந்தையலாது மேகம் வராது".

- தேரையர்

So the basic cause is disturbance of Azhal humour. Intrinsic and Extrinsic factors which affects the Azhal humors.

"கோதையர் கலவி போதை

கொழுத்த மீனிறைச்சி போதை

பாதுவாய் நெய்யும் பாலும்

பரிவுடனுண் பீராகில்

சோத பாண்டுருவ மிக்க

சுக்கில பிரமேகந்தான்

ஓது நீரிழிவு சேர

அண்டனெ வறிந்து கொள்ளே".

- Agasthiyar - 1200

"உற்பலிக்கும் பால்நெய்யா லிறைச்சி கள்ளால்
உரிசையாய் மீன்றன்னால் வருவி ருத்த
மற்பலிக்கும் பதார்த்தத் தால்மதுர வஸ்தால்
மந்தங்கள் தனிற்-பொசித்தல் வேகாப் பண்டம்
குற்பலிக்குங் குளிந்தவன்ன மங்கை கோஷ்டி
குறித்தநித் திரைதவிர்த லக்கினி மந்தம்
தற்பலிக்குஞ் சரீரந்தான் மிகப்ப ருக்கல்
சஞ்சலந்தான் பயன்படுதல் தரிக்கும் நோயே."

- Yugi Vaithiya cinthamani

From the above causes, the Azhal Kuttram is increased.

"பற்பிடித்த மேகம் என்றால் பித்த யீறும்
பாலகனே காகை கொண்டு நீராம் பாரே."

- Paripoorana naadi

The above stanza says that, increased Azhal kuttram – increases the moolakkanal, resulting in constant elimination of all the essential nutrient from the body through urine.

Primarily, due to intrinsic and extrinsic factors, the Azhal thathu in the body gets vitiated initially. This is followed by the derangement of metabolic energy (Moolakkanal) caused by involvement of vali force, ultimately the function of Vali and Iyam also become altered resulting in disturbance in homeostatic mechanism and functions of all the seven Udal Kattugal.

Gradually the Vital energy building factors essential for physiological, psychological and social well being and are being eliminated or excreted through urine due to increase in moolakkanal. As a result of this vital energy lossiyya humours gets disturbed.

*So in this disorder all “**The three thodams, major subdivisions of vali, and their functions and all the seven Udal kattugal are simultaneously affected.**”*

This is indicated clinically by the weakness of seven UdalKattugal and other complications, associated with this disease.

**“குறியுடனே மேகத்தான் கொடுமை செய்து
குறைந்து வருந்தாது வெல்லாக் குன்றிப் போகும்.”**

- Pathinen siddhar naadi nool

The above stanza says that the metabolic fire become acute, resulting in depletion of vital factors from the tissues leading to constant elimination of all the essential nutrient from the body through copious secretion and elimination of urine.

The symptoms of Pathachakkaram

"காணுதற்கு மரிய திமி ரெரிப்பு முண்டாய்க்
கனத்து வலித் திடுகிலிவை யுள்ளடி வாதந்தான்
சேனெரியு மக்கி விதர் போலத் தோன்றித்
தினவாகி நீர் பாய்ந்து செம்புண்ணாகித்
தோனு மெனி லிவை பாதச் சக்கரத்தின்
ஹாகுதி யெனவே முனிவன் சொன்ன வாரே."

- Thanvanthri Vaithiyam – II part

In Agasthiyar naadi book

"சொல்லவே வாதமது மீறிற்றால்
சோர்வடைந்த வாயுருவில் தேகமெங்கும்
மெய்முடங்கும் நிமிர்வொண்ணாத திமிர் உண்டாகும்."

In Pathachakkaram patients degenerative changes first occur in the peripheral nerves of the foot.

Abnormality in Azhal humour disturbs the normality of Vali humour, there by alters the neural mechanism in the body leading to degenerative changes in the peripheral nerves leading to Peripheral neuropathy, following the features of,

"காணுதற்கு மரிய திமி ரெரிப்பு முண்டாய்க்
கனத்து வலித் திடுகிலிவை யுள்ளடி வாதந்தான்."

- ❖ Numbness in the foot
- ❖ Burning sensation in the foot
- ❖ Heaviness of the foot
- ❖ Pain in the foot

Normally Vali is living in the nerves and its maintaining the normal physiological function of the body. It maintains both sensory and motor activities of the body. This concept is quoted as.

"வாதமாய் படைத்து"

So any alteration in vatham, degenerative changes occurs in nerves. It is quoted as.

"வாதமவாது மேனி கெடாது."

The last line of the poem describes the following line,

**"சேனையு மக்கி விதர் போலத் தேன்றித்
தினவாகி நீர் பாய்ந்து செம்புண்ணாகித்."**

The increased foot pressure causes the following features,

- ❖ *Callus formation*
- ❖ *Fissure in the callus*
- ❖ *Itching and whoozing*
- ❖ *Erythematous ulcer formed*

MODERN VIEW

"காணுதற்கு மரிய திமி ரெரிப்பு முண்டாய்க்
கனத்து வலித் திடுகிலிவை யுள்ளடி வாதந்தான்."
"சேனெரியு மக்கி விதர் போலத் தோன்றித்
தினவாகி நீர் பாய்ந்து செம்புண்ணாகித்."

- ❖ In this poem the author Thanvanthri has explained the ailment in the 2 steps
- ❖ In first 2 lines the author explain about the feature of Peripheral Neuropathy and in the next following 2 lines about the complication of Peripheral Neuropathy.

Features of Peripheral Neuropathy

"காணுதற்கு மரிய திமி ரெரிப்பு முண்டாய்க்
கனத்து வலித் திடுகிலிவை யுள்ளடி வாதந்தான்."

திமிர்	- Numbness
எரிப்பு	- Burning Sensation
கனம்	- Heaviness
வலி	- Pain
உள்ளடி	- Plantar region.

The above abnormal sensory phenomenon is divided in to two main categories.

❖ *Negative phenomenon*

❖ *Positive Phenomenon*

The most common type of diabetic neuropathy affects the nerves in the leg and usually known as Peripheral Neuropathy. It affects mainly the sensory nerves although the Motor and Autonomic nerves can also be involved with important consequences.

Negative phenomenon - திடுர், கனம்

Negative phenomenon is Numbness and Heaviness. It represent loss of sensory function and are characterized by diminished or absent feeling, often experienced as numbness.

In contrast to positive phenomena, negative phenomena are accompanied by abnormal findings on sensory examinations. In disorders affecting peripheral sensation, It is estimated that at least half the afferent axons innervations a given site are lost or functionless before Sensory deficit can be demonstrated by clinical examination. This estimate probably varies according to how rapidly sensory nerve fibers have lost function. Sensory Symptoms may be either positive or negative. But sensory signs on examination are always a measure of negative phenomena.

Positive phenomenon - எரித்தல், வலி

Positive Phenomenon is tingling (pins-and-needles). In addition the tingling it include other altered sensations that are often described as, Burning, pricking, band like, lancinations, aching, knifelike, twisting, drawing, pulling, electrical or raw feelings. These descriptors are frequently the actual words used by patients. Such sensations may or not be experienced as painful.

- ❖ *Both this positive and negative phenomena causes, the patient feels, the heaviness of foot*
- ❖ *People with poorly controlled diabetes for a long time are more likely to get chronic painful neuropathy.*
- ❖ *A number of theories have been suggested, for the symptom. It is thought that,*
 - *High blood glucose causes changes to the nerve fibers which results in abnormal nerve signals.*
 - *High blood glucose causes changes to blood vessels which supply the nerves.*
 - *Unknown factors release chemicals, that irritate the nerves and active pain receptors.*

Complication of Peripheral Neuropathy the Foot Ulcer

***"சேனெரியு மக்கி விதர் போலத் தோன்றித்
தினவாகி நீர் பாய்ந்து செம்புண்ணாகித்."***

<i>சேனெரி</i>	-	<i>Increase in size</i>
<i>அக்கி</i>	-	<i>Callus formation</i>
<i>விதர்</i>	-	<i>Fissure</i>
<i>தினவாகி நீர் பாய்ந்து</i>	-	<i>Itching and whoozing</i>
<i>செம்புண்</i>	-	<i>Erythematous ulcer.</i>

Formation of Callus – அக்கி

Callus is a cellular proliferation of epidermis produced by repeated pressure of friction. It presents with firm, raised, superficial, less demarcated, sis with localized area of compact scales.

Motor neuropathy leads to atrophy of the small muscles of the foot, with an imbalance between flexors and extensors. These changes result in clawing of the toes, prominent metatarsal heads, and forward migration of the fibro fatty pads. As a result, high pressure develop is under the metatarsal heads, both during standing and walking leads to

Callus Formation.

Fissure Formation – விதர்

High foot pressure combined with a dry, brittle skin (as a result of autonomic neuropathy) leads to callus formation, which act as a foreign body and can cause tissue damage and forms fissures leading to foot ulceration.

Causes for itching and whoozing - தினவாகி நீர்பாய்ந்து

A combination of Neuropathy, hyperglycemia and ischemia worsen the situation by reducing the defense mechanism. The diabetic foot ulcer is easily infected.

Foot has several compartments which are inter-communication and lack of pain due to neuropathy allows the patient to continue ambulation, facilitating spread of infection from one compartment to another.

*So, infection of foot ulcer cause **Itching And Whoozing** from the ulcer.*

Erythematous Ulcer - செம்புண்

Continued presence of infection, inside the foot leads to pressure effects on capillaries and neurovascular bundles causing further damage of tissues. It leads to reddish appearance of ulcer.

ANATOMY

As Pathachakkaram has Peripheral Neuropathy as cause of its occurrence, here in this dissertation anatomy of both sole and Neuron are described.

Anatomy of the Sole of foot

Muscles are arranged in four layers with the neurovascular bundles between first and second layers and then between third and fourth layers. There is only one plantar arch in the sole. All the intrinsic muscles, i.e. muscles confined to the sole only are supplied of either of the two plantar nerves. The extrinsic muscles of the sole are supplied by the nerve of the respective compartment. The tendon and muscles of the sole maintain, the arches of the foot.

The structure of the sole

- ❖ *Skin*
- ❖ *Superficial Fascia*
- ❖ *Muscles*
- ❖ *Vessels and nerves*

Skin

The skin of the sole, like that of the palm is

- ❖ *Thick for protection.*
- ❖ *Firmly adherent to the underlying plantar aponeurosis creased.*
- ❖ *These features increase the efficiency of the grip of the sole on the ground.*

Nerve supply

The skin is supplied by three cutaneous nerves

- ❖ *The medial calcaneal branches of the Tibial Nerve to the posterior and medial portions.*
- ❖ *Branches from the Medial plantar nerve to the smaller anterolateral portion including the lateral one and half a digits.*
- ❖ *These nerves are derived from spinal nerves L_4 , L_5 and S_1*
- ❖ *In eliciting the plantar reflex, the area supplied by segment S_1 is stimulated.*

Superficial Fascia

The superficial fascia of the sole is fibrous and dense. Fibrous bands bind the skin to the deep fascia or plantar aponeurosis, and divide the subcutaneous fat into small and tight compartments, which serve as water - cushions and rein force the spring-effect of the arches of the foot during walking, running and jumping. The fascia is very thick and dense over the weight-bearing points. It contains cutaneous nerves and vessels.

Deep Fascia

The deep fascia of the sole is specialized to form

- ❖ *The plantar aponeurosis in the sole.*
- ❖ *The deep transverse metatarsal ligaments between the metatarso phalangeal joints.*
- ❖ *The fibrous flexor sheaths in the toes.*

Layers of the foot

The muscles of the sole are arranged in 4 layers.

I. First Layer

3 Short muscles lie side by side along the sole of the foot.

1. Flexor digitorum brevis

Action

It flexes the proximal interphalangeal and the metatarso phalangeal. Its of the lateral 4 toes, and helps to reinforce the longitudinal arch of the foot.

Nerve supply - Median plantar Nerve.

2. Abductor hallucis

Action - It moves the big toe away from the second toe.

Nerve supply - Medial plantar nerve.

II. Second layer

This consists of the long flexor tendons and their connections in the sole. These are

- ❖ *Tendon of flexor hallucis longus.*
- ❖ *Tendon of flexor digitorum longus.*

Flexor accessories

Action

By pulling on the tendons of flexor digitorum longus, It provides a means of flexing the lateral four toes in any position of the ankle joint, particularly in full plantar flexion.

Lumbrical muscles

Nerve supply *Median plantar N.*

Lateral plantar N.

Action

It maintains extension of the digits at the interphalangeal joints, while the flexor digitorum longus tendons, are flexing the toes, so that in walking and running the toes do not buckle under.

III. Third Layer *It consists,*

1. Flexor hallucis brevis

Action - *To flex the proximal phalanx of the big toe.*

Nerve supply - *Medial plantar nerve.*

2. Adductor hallucis

Action

The muscle draws the big toe towards the axis of the metatarsus and thus assists in maintaining the transverse arch.

Nerve supply - *Lateral plantar nerve*

3. Flexor digiti minimi brevis

Action - *To assist in flexing the little toe.*

Nerve supply - *Superficial branch of the lateral plantar nerves.*

IV. Fourth layer

It consists of the interossei in the intermetatarsal spaces.

Interosseous muscle

Action

The adducting and abducting actions of the interossi are of little significance in the human foot. It is more important that; like their companions in the hand, they assist the lumbricals in extending the interphallangeal joints and flexing the metatarso phalangeal joints.

Nerve supply: *Lateral plantar nerve.*

Plantar vessels:

The chief arteries of the sole are the

❖ *Median plantar artery.*

❖ *Lateral plantar artery.*

They are terminal branches of the posterior tibial artery

Median plantar artery

Table - 6

<i>Branches</i>	<i>Structure supplied by them</i>
<i>1. Cutaneous branches</i> <i>2. Muscular branches</i> <i>3. Three small superficial digital branches</i>	<i>Supplying the overlying skin and toe the adjoining muscles.</i> <i>digits</i>

Lateral plantar Artery

Table – 7

<i>Branches</i>	<i>Structures supplied by them</i>
<i>1. Muscular branches</i>	<i>Supply the adjoining muscles</i>
<i>2. Cutaneous branches</i>	<i>Supply the skin and fasciae of the lateral part of the sole.</i>
<i>3. Anastamotic branches</i>	<i>Reach the lateral border of the foot and anastamose with arteries on the dorsum of the foot.</i>
<i>4. Calcaneal branches</i>	<i>Is occasionally given off to the skin of the heel.</i>

Plantar Nerves

The chief nerves of the sole are the,

❖ *Medial plantar nerve*

❖ *Lateral plantar nerve*

They are terminal branches of the tibial nerve.

Median plantar nerve:

Table – 8

<i>Branches</i>	<i>Structures supplied by them</i>
<i>1. Muscular branches</i>	<i>a. Abductor hallucis.</i>
<i>2. Cutaneous branches</i>	<i>b. Flexor digitorum brevis.</i>
<i>3. Articular branches</i>	<i>c. Flexor hallucis brevis.</i>
	<i>Skin of the medial part of the sole.</i>
	<i>Medial 3½ of toes through four</i>
	<i>digital arteries.</i>
	<i>Joints of the tarsus and metatarsal.</i>

Lateral plantar nerve

Table – 9

<i>Branches</i>	<i>Structures supplied by them</i>
<i>1. Main trunk</i>	<i>Flexor digitorum accessorius.</i>
	<i>Abductor digiti minimi.</i>
	<i>Skin of the sole.</i>
<i>a) Superficial branch</i>	<i>Flexor digiti minimi brevis</i>
	<i>3rd plantar interossi</i>
	<i>4th dorsal interossi</i>
	<i>skin on the lateral side of the little</i>
	<i>toe.</i>

<i>b) Deep branch</i>	<i>II, III, IV lumbricals.</i> <i>Adductor halucis.</i> <i>I, II, III dorsal interossi</i> <i>I, II plantar interossi</i> <i>First three intermetatarsal spaces.</i>
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(A). ANATOMY OF THE NEURON

The peripheral nervous system is formed by neurons and their processes present in all regions of the body. It provides the links from and to the real world. Its ghostly white nerves thread through virtually every part of the body enabling the CNS to receive information and carry out its decisions. It includes all neural structures outside the brain and spinal cord that is the sensory receptors, peripheral nerves and their associated ganglia and efferent motor endings. Neurons or nerve cells are structural and functional unit of the nervous system.

Structure of neuron

The nerve cell is like any other cells in the body having almost all the organelles in the cytoplasm. However it is different from other cells because of the presence of the processes and absence of centrosomes (centrosome function is formation of cilia and flagellae and it forms the spindle of fibrillary protein during mitosis.) The neuron is made up of.

1. Nerve cells

2. Dendrite

3. Axon

The nerve cell body is also called as soma or perikaryon. The dendrite and axon together form the processes. Each neuron has only one axon. The axon arises from axon Hillock of soma.

The dendrites may be absent or if present it may be one or many in number. In general, the dendrites are short processes and the axons are long processes. The dendrites and axons are usually called nerve fibers.

1. Nerve cell body

The nerve cell body is irregular in shape and like any other cell it is constituted by a mass of cytoplasm called neuroplasm covered by a cell membrane. The cytoplasm contains a large nucleus, Nissl bodies, neurofibrils, mitochondria and golgi apparatus.

(i) Nucleus

Each neurons has only one nucleus in the nerve cell body. It is located in the central part. It has one or two nucleoli which are prominent. The nucleus does not contain centrosome. So the nerve cell can not multiply like the other cells.

(ii) Nissl bodies

Nissl bodies or granules are basophilic in nature. These granules are present through out soma except axon Hillock. These bodies are responsible for spotted appearance of soma after suitable staining. The nissl granules flow into the dendrites from soma. But not into axon. By this axons can be distinguished from the dendrites.

The nissl bodies are organelles responsible for synthesis of proteins. The formed proteins in soma are transported to the axon by axonal flow.

The number of nissl bodies varies with the condition of the nerve. During fatigue or injury of neuron, these bodies fragment and disappear by a process called chromatolysis.

Neurofibrills

These are thread like structures present in the form of network in soma and the processes. These consist of microfilaments and microtubules.

Mitochondria

It form the powerhouse of the nerve cell where ATP is produced which is energy rich compound.

Golgi apparatus is concerned with package of proteins into granules.

2. Dendrite

The dendrites are the branched processes of the neuron and are branched repeatedly. The dendrites may be present or absent. The dendrites have nissl granules and neurofibrils.

Dendrites are conductive in nature and transmit impulses towards the nerve cell body.

3. Axon

The axon is the longer process of the nerve cell. This arises from axon Hillock of the nerve cell body and is devoid of nissl granules. The axon may extend for a long distance away from the nerve cell body. The length of the longest axon is about one metre.

(i) Structure of axon

Within a nerve, each axon is surrounded by a delicate layer of loose connective tissue called endoneurium, which also encloses the fiber's associated myelin and/or neurilemma sheath. Group of fibers are bound into bundles or fascicles by a coarser connective tissue, wrapping the perineurium. Finally, all the vesicles are enclosed by a tough fibrous sheath, the epineurium, to form the nerve.

Neuron processes constitute only a small fraction of a nerve's myelin and the protective connective tissue wrappings. Blood vessels and lymphatic vessels are also found within a nerve.

Internal structure of axon

Axis culinder

The axon has long central core of cytoplasm called axoplasm. The axoplasm is covered by membrane called axolemma. Axoplasm contains mitochondria, neurofibrils and axoplasmic vesicles. Most of the axons are insulated by myelin sheath called as myelinated nerve fiber. Those, without myelin are called non-myelinated nerve fibers.

Myelin sheath

It does not form a continuous sheath and is absent at regular intervals. The area where myelin sheath absent is called node of Ranvier. It is responsible for white colour of nerve fibers.

Neurilemma

Surrounding the myelin sheath, there is thin membrane called as neurilemmal sheath. This is also called as neurilemma or sheath of schwann. This contains schwann cells which have flattened and elongated nuclei. One nucleus is present in each internode of axon.

The nucleus is situated between myelin sheath and neurilemma.

In central nervous system, the schwann cells, neurilemma are absent. Myelinated axons are thicker in diameter and have their origin from neurous in the posterior root ganglia and anterior horn cells of spinal cord. Where as non-myelinated axons arise from neurons in posterior root ganglia and in autonomic ganglia.

PHYSIOLOGY

PHYSIOLOGY OF THE FOOT

The function of the foot as a supporting structure, which has to carry considerable static loads in standing and even greater loads at the point of application of severe thrust forces e.g. in kicking, pushing off in running, and landing on the feet when jumping from a height.

When standing, the weight is supported on the heel and on the heads of the metatarsal (mainly the first metatarsal) and to a lesser extent on the lateral border of the sole of the foot.

When the foot is used in thrusting, the force is carried principally on the head of the first metatarsal and the big toe. The remaining metatarsals and toes are relatively weak and can be looked upon as a stabilizing flat. Without them the foot would have an unstable, two-point contact, with the ground on the calcaneus and the ball of the great toe. The arched shape of the foot has the added advantages of giving protection to the structures in the sole which would otherwise be subjected to pressure. One special development to resist the pressure on the head of the first metatarsal, e.g. running, is the presence on its plantar surface of two sesamoid bone. These transmit the pull of the small muscles of the big toe without subjecting them to pressure, and also make

a tunnel between them through which the long flexor tendon can reach the toe.

B) PHYSIOLOGY OF THE NEURON

Nervous system controls all the activities of the body. It is quicker than the other control system in the body namely the endocrine system. Primarily, the nervous system is divided into central and peripheral nervous system. The central nervous system includes brain and spinal cord.

Peripheral nervous system consists of cranial nerves arising from brain and spinal nerves arising from spinal cord. This is again divided into somatic and autonomic nervous system. The somatic nervous system controls the movements of the body by acting on the skeletal muscles. The autonomic or involuntary nervous system is concerned with regulation of visceral or vegetative functions. It consists of sympathetic and para-symphathetic division. Groups of neuronal cell bodies in peripheral nervous system are called as ganglia.

Classification of neuron

The neurons can be classified by 3 different methods which are,

- 1. Depending upon the number of poles, divided into unipolar, bipolar and multipolar neurons.*
- 2. Depending upon the function, divided into motor and sensory neurons.*

3. *Depending upon the length of axon, divided into golgi type I neurons and golgi type II neurons.*

Classification of nerve fibers

The dendrites and axons are usually called nerve fibers. Following are the various methods of classification of nerve fibers.

1. *Depending upon the structure, classified into myelinated nerve fibers and non-myelinated nerve fibers.*
2. *Depending upon the chemical neurotransmitter, divided into adrenergic and cholinergic nerve fibers.*
3. *Depending upon the diameter and conduction, divided into alpha, beta and delta fibers.*

Properties of nerve fibers

1. *Excitability*
2. *Conductivity*
3. *Refractory period*
4. *Summation*
5. *Adaptation*
6. *Infatigability*
7. *All or none law*

1. Excitability

Excitability is defined as the physiochemical change that occurs in a tissue when a stimulus is applied. Depending upon the strength of the stimulus, two types of responses occur which are actions potential and electro tonic potential.

2. Conductivity

The action potential is transmitted through the nerve fiber as nerve impulse.

3. Refractory period

It is the period at which the nerve does not give any response to a stimulus.

4. Summation

The subliminal stimuli are summed up together. This is known as summation.

5. Adaptation

The excitability of the nerve fiber is decreased when there is slow increase in the strength of the stimulus. This is known as adaptation.

6. Infatigability

A nerve fiber can not be fatigued, even if it is stimulated continuously for a long time. The reason for this is, the nerve fiber can conduct only one action potential at a time.

7. All or none law

If the strength of the stimulus is above the sub-threshold level, the amplitude of action potential remains the same. This character is called as all or none law.

Myelin sheath

In a myelinated nerve fiber, the axis cylinder is covered by thick tubular sheath called myelin sheath. It is responsible for the white colour of the nerve fibers. It is mainly formed by the concentric layers of proteins alternating with lipids. It's function is for faster conduction of impulse through the nerve fibers. It also has a high insulating capacity. Because of this, the myelin sheath restricts the nerve impulse within the single nerve fiber and prevents the stimulation of neighbouring nerve fibers.

Surrounding the myelin sheath, there is neurilemmal sheath or sheath of Schwann. It is necessary for myelinogenesis. Nerve fibers in the peripheral nervous system transmit signals between central nervous system and all other parts of the body. The nerve fiber is surrounded by a Schwann cell which is analogous to an oligodendroglial cell of the central nervous system. Some of the fibers are wrapped in layers of Schwann cell membrane. These tightly wrapped membranes from the myelin sheath and other fibers are unmyelinated. Synapse is the junction

point from one neuron to the next and therefore it is an advantageous site for control of signal transmission.

When a peripheral nerve fiber is cut, the degenerative change occurs in the nerve cell body and in the nerve fiber. The regeneration of injured nerve fiber can occur only under favourable condition. Through the anatomical regeneration occurs in the nerve, the functional recovers occur after a long period.

PATHOLOGY

Diabetic foot

The Diabetic Foot is a most feared and devastating disease. Diabetic foot is a quiet of disability, long stretches of hospitalization, mounting impossible expenses , with the ever dangling end result of an amputation.

Diabetes mellitus

Diabetes mellitus is a group of metabolic disorders characterized by hyperglycemia resulting from defects in insulin secretion, insulin action or both . The hyperglycemia of diabetes is associated with long-term damage, dysfunction and failure of various organs, especially the eyes, kidneys, nerves and blood vessels.

Clinical Diagnosis of Diabetes mellitus

The clinical diagnosis of diabetes is often prompted by signs and symptoms such as

- ❖ *Polydypsia.*
- ❖ *Poly ureia.*
- ❖ *Unexplained weight loss.*
- ❖ *Undue tiredness.*
- ❖ *Tingling (or) numbness in the extremities.*
- ❖ *Burning feet.*
- ❖ *Balanitis.*
- ❖ *Vaginitis.*

Etiology of Diabetes mellitus:

- ❖ *Genetic Factors*
- ❖ *Obesity ($\geq 20\%$ desire body weight)*
- ❖ *Age - ≥ 45 yrs.*
- ❖ *H/o – Gestational diabetes mellitus.*
- ❖ *Hypertension – BP $\geq 140/90$ mmHg.*
- ❖ *HDL Cholesterol Level - ≤ 35 mg/dl (or) Triglycerides Level ≥ 250 mg/dl.*
- ❖ *Polycystic ovary syndrome.*

Classification of Diabetes mellitus:

I Type I diabetes:

- ❖ *Immune mediated.*
- ❖ *Idiopathic*

II Type 2 diabetes:

III Gestational diabetes:

IV Other specific Types:

- ❖ *Genetic defects in β cell function (MODY)*
- ❖ *Genetic defects in insulin action (Lipoatrophy diabetes)*
- ❖ *Diseases of exocrine pancreas (Fibrocystic pancreatopathy)*
- ❖ *Endocrinopathies (Cushing's syndrome)*
- ❖ *Drug induced (glucocorticoids)*

- ❖ *Infections (congenital rubella)*
- ❖ *Uncommon form of immune mediated diabetes (“stiff-man” syndrome)*
- ❖ *Other genetic syndromes (Turner’s syndrome)*

Foot ulcers of infections are also a major source of morbidity in individual with diabetes mellitus.

Other complications of Diabetes

A. Infections.

B. Metabolic.

- ❖ *Hypoglycemia (mainly a complication of drug therapy of diabetes).*
- ❖ *Ketoacidosis.*
- ❖ *Hyper osmolar non ketotic coma.*
- ❖ *Lactic acidosis.*

C. Angiopathic complications.

Microangiopathic (involving small vessels).

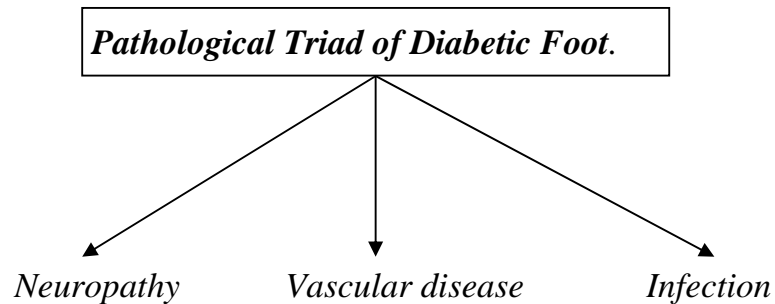
- ❖ *Retinopathy.*
- ❖ *Neuropathy.*
- ❖ *Nephropathy.*

Macroangiopathic (involving large vessels).

- ❖ *Coronary artery disease.*
- ❖ *Cerebro vascular disease.*
- ❖ *Peripheral vascular disease.*

The Diabetic Foot

Diabetic Foot cause more leg amputations than any other pathology, 85% of leg amputations in diabetes are preceded by a trivial look foot ulcer. All leg amputations are not inevitable.



Classification

Two types,

- 1. Neuropathic foot – in which Neuropathy dominates*
- 2. Neuro ischaemic foot – in which occlusive vascular disease is the main factor. (Although Neuropathy also may be present in varying degrees).*

*Another classification quoted commonly is the **Wagner's** Classification. It is more specific for Neuropathic foot with or without secondary infection.*

Wagner's classification of diabetic foot

- Grade 0 : No ulceration in a high risk foot.*
- Grade 1 : Superficial ulceration.*
- Grade 2 : Deep ulceration that penetrates up to tender, bone or joint.*
- Grade 3 : Osteomyelitis or deep abscess.*
- Grade 4 : Localized gangrene.*
- Grade 5 : Extensive gangrene requiring major amputation.*

NEUROPATHY

“Sensations are important, If they are lost, the entire charm in the life is lost”

Diabetic Neuropathies are a group of heterogeneous syndromes with considerable morbidity. At least 50% of diabetic patients, develop neuropathy with 10 - 25 yrs of diagnosis. The prevalence of neuropathy is difficult to document as it varies with the sensitivity of the method used. The gross disparity is also due to general lack of agreement regarding the standard definition of diabetic neuropathy.

The neuropathic disorder includes manifestations, in the somatic and autonomic parts of the peripheral nervous system.

Clinical classification of diabetic neuropathy

1. *Bilaterally symmetrical peripheral polyneuropathy.*
 - a. *Sensory polyneuropathy*
 - b. *Motor polyneuropathy*
 - c. *Mixed sensory motor polyneuropathy.*
2. *Symmetrical (or) Asymmetrical proximal mononeuropathy.*
3. *Mononeuropathy.*
 - a. *Cranial neuropathy*
 - b. *Peripheral neuropathy*
4. *Abdominal polyradiculopathy*
5. *Autonomic neuropathy.*

Neuropathy in Diabetic foot:

Diabetic mellitus is one of the commonest cause of disabling polyneuropathy. Neuropathic changes in the diabetic foot are a, heterogeneous mixture of disorders including distal neuropathy, which is usually progressive, Ischaemic neuropathy, Diabetic amyotrophy, and Neuro arthropathy. The progressive is a loss of touch, vibration, pain, and temperature sensation.

Neuropathy involved in foot ulcer's

- ❖ *Sensory neuropathy.*
- ❖ *Motor neuropathy.*
- ❖ *Mono neuropathy (or) peripheral neuropathy.*
- ❖ *Autonomic neuropathy.*

Sensory Neuropathy

Somatic sensory neuropathy involves both large fibres. Such as those serving modalities of joint position, and vibration, and contributing to that of touch and small fibres. Which serve as pain and sensory as well as contributing to touch.

This type of neuropathy is almost always largely symmetrical and affects predominantly the leg.

It is responsible for the loss of tendon jerk first at the ankles.

Motor Neuropathy

Motor neuropathy affects nerves asymmetrically and usually involves part of the femoral plexus.

It reduces the nerve conduction velocity and may partially impair muscle function.

Motor defects causing foot deformity, produce abnormal pressure points on weight bearing areas.

Mono Neuropathy

Mono neuropathy can result from pressure palsy or from a vascular accident to a nerve. Both motor and sensory nerves are unduly vulnerable to pressure in diabetes. Occasionally clinical episodes occur that suggests a stroke affecting a peripheral nerve, with excruciating short lived pain followed by interrupted nerve function. Mononeuropathy may be multiple, giving the clinical picture of mononeuritis multiplex, with interruption of more than one peripheral nerve trunk.

Autonomic Neuropathy

In diabetic foot autonomic neuropathy has several common manifestations, first denervation of dermal structures leads to decreased sweating.

This cause only skin and fissure formation, which predispose the skin to infection.

Such a foot is at risk of complications like.

- ❖ *Neuropathic ulcer.*
- ❖ *Neuropathic oedema.*
- ❖ *Fissures*
- ❖ *Bullae*
- ❖ *Neuropathy charcot joint.*

Etiology of Diabetic Neuropathy:

A) Metabolic

- ❖ *Hyperglycemia.*
- ❖ *Lipid disturbances.*

B) Vascular

C) Others

- ❖ *Mechanical factors.*
- ❖ *Stress.*
- ❖ *Autoimmunity.*
- ❖ *Hereditary.*

PATHOGENESIS OF DIABETIC NEUROPATHY

Multiple pathogenetic mechanisms interact to varying degrees in producing a clinical picture of neuropathy which differs from patient to patient.

Multifocal ischaemic neuropathy with distal summation of axonal loss may be important in elderly patients. However, it is likely that diffuse consequences of the metabolic disturbance are more prominent in causing the polyneuropathy of younger patients.

Pathological Process of Diabetic Neuropathy

➤ Persistent Hyperglycemia

Accumulation of

- 1. Sugar,*
- 2. Sorbitol and*
- 3. Glycogen **causing osmotic damage to the nerves.***

It may activate the polyol pathway in nerve causing sorbitol accumulation as a result of enhancing aldose reductase activity.

Proposals that this might inhibit myoinositol uptake by nerve fibres, resulting in altered impulse conduction due to reduced Axolemmal Na⁺K⁺ Atpase activity have been contra indicated by the demonstration that myoinositol is not decreased in diabetic nerve.

The levels of glucose and fructose are increased in diabetic nerves and correlate with morphometric estimates of the severity of neuropathy. Accumulation of these sugars can promote non-enzymatic glycosylation of peripheral nerve proteins, probably altering their function.

Slow axonal transport of microtubule and neurofilament cytoskeletal proteins to the distal axon is reduced. This could affect the structural integrity of the distal axon and account for the axonal length related neuropathy of diabetes.

➤ ***Lipid disturbances***

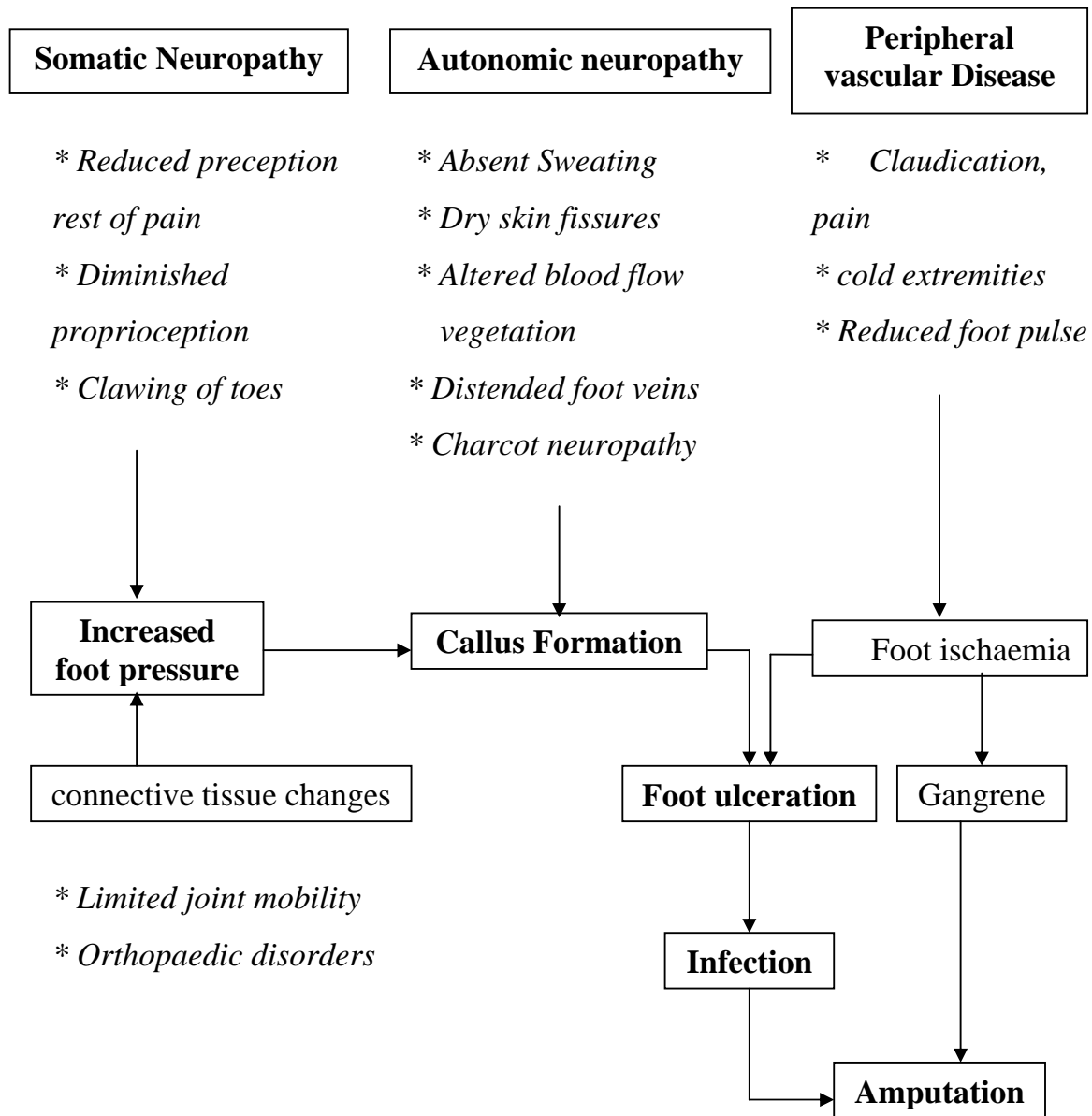
Accumulation inhibitory defect with lipid accumulation of fatty material in the schwann cell that interferes with their activity.

Cofactor deficiency, enzymatic inhibition, or enzymatic deficit, which affects the transformation of lipids and proteins.

➤ ***Ischaemia***

Ischaemia is due to Atherosclerosis or diabetic microangiopathy.

PATHWAY LEADING TO FOOT ULCERATION AND AMPUTATION IN DIABETIC FOOT ULCER



PATHOGENESIS OF DEVELOPMENT OF ULCER

Foot ulcers and infections are also a major source of morbidity in individuals with DM. The reasons for the increased incidence of these disorders in Diabetes mellitus are complex and involve the interaction of several pathogenic factors.

- ❖ Neuropathy.*
- ❖ Abnormal foot Bio-mechanics.*
- ❖ Peripheral vascular disease.*
- ❖ Poor wound healing.*
- ❖ Infection.*

Neuropathy

The peripheral sensory neuropathy interferes with normal productive mechanisms, and allows the patient to sustain major (or) repeated minor trauma to the foot, often without knowledge of the injury.

*Disordered proprioception causes abnormal weight bearing while walking and subsequent **formation of callus (or) ulceration.***

Autonomic neuropathy results in anhydrosis and altered superficial blood flow in the foot, which promote drying of the skin and fissures formation.

Abnormal foot Biomechanics

Motor and sensory neuropathy leads to abnormal foot muscle mechanics and to structural changes, in the foot.

These are,

- ❖ *Hammer toe.*
- ❖ *Low toe deformity.*
- ❖ *Prominent metatarsal heads.*

Peripheral Vascular Disease

Peripheral vascular disease and poor wound healing impede resolution of minor breaks in the skin allowing them to enlarge and to become infected.

Foot infection

Foot infections in diabetic patients are classified in to two categories:

- 1. Non-limb-threatening infections, (superficial, lack systemic toxicity, minimal cellulites, less than 2cm, ulceration not extending fully through the skin, lack of significant ischaemia).*
- 2. Limb threatening infections, (extensive cellulites, lymphangitis, ulcers penetrating through the skin in to the subcutaneous tissues, prominent ischaemia).*

Polymicrobial infections are common staphylococcus aureus, group-B streptococci, enterococcus and facultative gram negative bacilli along with anaerobes are commonly implicated.

Factors contributing to foot ulceration

Table – 10

<i>Intrinsic Factors</i>	<i>Extrinsic Factors</i>
❖ <i>Bony Prominence</i>	❖ <i>In appropriate Foot wear</i>
❖ <i>Limited joint mobility</i>	❖ <i>Walking bare Foot</i>
❖ <i>Deformities</i>	❖ <i>Falls and accidents</i>
❖ <i>Callous Formation</i>	❖ <i>Objects inside shoe</i>
❖ <i>Previous Foot ulcer</i>	❖ <i>Thermal trauma</i>
❖ <i>Neuro arthro pathy (charcot)</i>	❖ <i>Activity level</i>

Classification of Diabetic Foot

The diabetic foot is classified into two types.

- ❖ ***Neuropathic Foot*** – *in which neuropathy dominates.*
- ❖ ***Neuroischaemic Foot*** – *in which occlusive vascular disease is the main factor, neuropathy also present in varying degree.*
- ❖ *Hence peripheral neuropathy is viewed as a primary underlying disturbance of diabetic foot lesions and vascular insufficiency is an important secondary factor.*

The ulcers are painless, with a punched out appearance, foot is characteristically warm and pulses are easily felt. Secondary infection is common and may lead to wet gangrene.

Clinical Features of Diabetic Foot

Table - 11

<i>Primarily Neuropathic</i>	<i>Primarily ischaemic</i>
<i>Warm</i>	<i>Cold</i>
<i>Bounding Pulses</i>	<i>Absent Pulses</i>
<i>Diminished Sensations</i>	<i>Sensation intact</i>
<i>Pink skin</i>	<i>Skin blanches on elevation</i>
<i>Anhydrosis</i>	--
<i>Callous Formation</i>	--
<i>Cracks and Fissures</i>	--
<i>Painless ulceration</i>	<i>painful ulceration</i>
<i>Digital ulceration</i>	<i>digital gangrene</i>
<i>Reddish appearance</i>	<i>Blackening of ulcer</i>
<i>Charcot's joint</i>	--
<i>Wasting of interosseous muscles</i>	--
<i>Clawed toes</i>	--
<i>Neuropathic Oedema</i>	<i>oedema associated with cardiac decompensation</i>

EVALUATION OF THE DISSERTATION TOPIC

Materials & Methods

The pathological evaluation on Topic “PATHACHAKKARAM” was carried out in the Post – graduate Department of Noi – Naadal branch in Government Siddha Medical College, Palayamkottai.

Selection of cases

The author has selected 20 cases with similar symptoms of “Patha Chakkaram” from the Out Patient Department of Govt. Siddha Medical College, Shifa Hospital, Velaudhan Pillai Hospital and the cases were followed by the author whose work was under close supervision of the professor and faculties, of the Post graduate department of Noi - Naadal.

Clinical Features of pathachakkaram.

- ❖ *Numbness in the foot*
- ❖ *Burning sensation in the foot*
- ❖ *Heaviness in the foot*
- ❖ *Callus formation of the foot*
- ❖ *Fissuring in the callus*
- ❖ *Itching and whoozing from the ulcer*
- ❖ *Reddish ulcer*

Evaluation of Clinical parameters

The detailed history and Clinical features of the patients were taken carefully.

The clinical history contains,

- ❖ *Detailed history of past and present illness*
- ❖ *Family History*
- ❖ *Age and Sex distribution*
- ❖ *Personal history*
- ❖ *Dietary habits*
- ❖ *Occupational history*
- ❖ *History of improper management of diabetes.*

Study on Siddha Clinical Diagnosis

The following Siddha parameters, such as Porial arithal, Pulanaal arithal, and Vinaathal, were adopted to assess the pathology.

- ❖ *Mukktra Nilai*
- ❖ *Udal Kattugal Nilai*
- ❖ *Envagai Thervugal*

The Clinical Investigation

The author used the following modern investigatory parameters for further detailed study about this disease.

Haematological

- ❖ *Total count of RBC*
- ❖ *Differential count of WBC*
- ❖ *HB*
- ❖ *ESR*

Bio Chemical

- ❖ *Blood sugar*
- ❖ *Urine analysis*
- ❖ *Motion test*

Specific Test

- ❖ *Bio – Thesiometer,*
- ❖ *Doppler study*
- ❖ *Podia scan*

STATISTICAL ANALYSIS AND INTERPRETATIONS

The study subjects were analysis based on the statistics mean, median, percentage and standard deviation (S.D). The inferences were attained by students 't' test. The risk factors of the diseases were inference by odds ratio since the study is Epidemiological related.

OBSERVATION AND RESULTS

AGE AND SEX

Age and sex are vital independent variables related to human studies. The analysis and interpretations of the age of the study subjects with reference to sex are posted in the below table.

Age and sex wise distribution of the patha chakkarm subjects

Table-12

S. No.	Sex	Age group					Total	Mean	S.D	't'	Significance
		30-39	40-49	50-59	60-69	70-79					
1.	Male	2	3	5	6	2	18	55.6	11.1	1.09	$P>0.05$
2.	Female	1	0	1	0	0	2	46.5	12.0		
3.	Total	3	3	6	6	2	20	54.7	11.2		

The mean age of the male subjects 55.6 + 11.1 years and the same of the female is 46.5 + 12 years. The observed differences of mean age is

not statistical significant, since the ' t ' = 1.09 and $P > 0.05$. The differences may be due to sampling size. So the sexes are having the same age group. The mean age of pathachakkaram population will be 49.7 to 59.7 years at 95% confidence interval.

ETIOLOGICAL FACTOR

Etiological Factors of pathachakkaram

Table-13

S. No.	<i>Etiological Factors</i>	<i>n</i>	<i>Cases affected</i>	
			<i>No. of cases</i>	<i>% of cases</i>
1.	<i>H/O diabetes mellitus</i>	20	20	100
2	<i>Evidence Neuropathy</i>	20	20	100
3.	<i>Callus at Pressure points</i>	20	15	65

The history of diabetes mellitus and Neuropathy observed cent percent and callus at Pressure points is 65%.

RISK FACTORS

Some habits may be the risk Factors of the disease since the Diabetes and Hypertension prevalence is cent percent in the study subjects.

Risk Factors Related to Diabetes and Hypertension

Table -14

<i>S. No.</i>	<i>Risk Factors</i>	<i>n</i>	<i>Odds ration</i>	<i>Significance</i>	<i>Risk Fold</i>
<i>1.</i>	<i>Alcohol with Smoking</i>	<i>16</i>	<i>115.5</i>	<i>Significant</i>	<i>115 times risk</i>
<i>2.</i>	<i>Intake of alcohol and excessive sweets</i>	<i>3</i>	<i>1</i>	<i>Not significant</i>	<i>No risk</i>
<i>3.</i>	<i>Obesity and High fatty diet</i>	<i>6</i>	<i>49.58</i>	<i>Significant</i>	<i>50 times risk</i>
<i>4.</i>	<i>Excessive sexual act and alterations of sleeping rhythm</i>	<i>5</i>	<i>0.56</i>	<i>Not significant</i>	<i>No risk</i>

The above table clearly illustrates that the risk factor of Alcohol usage with smoking is 115 times risk than the either smoking or Alcohol in take and those who are not using both. The intake of Alcohol and excessive sweets take is not having any risk than the using of either of them.

The risk of obese population are taking high fatty diet is 50 time risk than those who have obese and not taking high fatty food. The risk of Excessive sexual act and alterations of sleeping rhythm is not any risk with diseases. Since the pathachakkaram subjects are cent percent

diabetes and hypertensive the analysed risk factors may also be an etiology to pathachakkaram diseases.

MUKKTRA NILAIGAL

Distribution of mukktra nilaigal

Table - 15

S. No.	Component	n	Types	Affected cases	
				No of cases	% of cases
1.	Vali	20	<i>Pranan</i>	20	100
			<i>Abanan</i>	20	100
			<i>Viyanan</i>	20	100
			<i>Uthanan</i>	19	95
			<i>Samanan</i>	20	100
			<i>Nagan</i>	11	55
			<i>Koorman</i>	15	75
			<i>Kirukaran</i>	20	100
			<i>Devathaththan</i>	20	100
			<i>Dhananjeyan</i>	-	-
2.	Azhal	20	<i>Anal pitham</i>	20	100
			<i>Ranjaga pitham</i>	18	90
			<i>Sathaga pitham</i>	20	100
			<i>Aalosaga pitham</i>	11	55
			<i>Prasaga pitham</i>	20	100

3.	Iyam	20	Avalampagam	20	100
			Kilethagam	20	100
			Bothagam	-	-
			Tharpagam	2	10
			Santhigam	16	80

From the above table, mukkutra nilaigal namely pranan, Abanan, Viyanan, Samanan, Kirukaran and Devathaththan are affected cent percent of the cases under Vali. In respect of Azhal, Anal pitham, Sathaga pitham and Prasaga pitham are affected cent percentage of the subjects. Avalampagam and Kilethagam of Iyam are affected cent percent of the patha chakkaram trials. The remaining types of mukkutra nilaigal affected and their percentage are noted against them.

UDAL THATHUKKAL

Percentage distribution of subjects affected by Udal Thathukkal

Table-16

<i>S.No</i>	<i>Udal Thathukkal</i>	<i>N</i>	<i>Affected cases</i>	
			<i>No of cases</i>	<i>% of cases</i>
<i>1.</i>	<i>Saaram</i>	<i>20</i>	<i>20</i>	<i>100</i>
<i>2.</i>	<i>Senneer</i>		<i>20</i>	<i>100</i>
<i>3.</i>	<i>Oon</i>		<i>20</i>	<i>100</i>
<i>4.</i>	<i>Kozhuppu</i>		<i>20</i>	<i>100</i>
<i>5.</i>	<i>Enbu</i>		<i>15</i>	<i>75</i>
<i>6.</i>	<i>Moolai</i>		<i>15</i>	<i>75</i>
<i>7.</i>	<i>Sukkilam/ Suronitham</i>		<i>10</i>	<i>50</i>

From the above table, the cent percentage of affected Udal thathukkal are Saaram, Senneer, Oon and Kozhuppu. The Enbu and Moolai are affected 75% of each. The Sukkilam/ Suronitham is affected only in 50% of the subjects.

MANIKADAI NOOL

The Viralkadai alavu of the diseases are enumerated in the below table

Distribution of Viralkadai alavu of the subjects.

Table - 17

<i>S. No.</i>	<i>Viralkadai alavu</i>	<i>n</i>	<i>Affected cases</i>	
			<i>No of cases</i>	<i>% of cases</i>
<i>1.</i>	<i>7 $\frac{3}{4}$</i>	<i>20</i>	<i>12</i>	<i>60</i>
<i>2.</i>	<i>7 $\frac{1}{2}$</i>		<i>6</i>	<i>30</i>
<i>3.</i>	<i>7 $\frac{1}{4}$</i>		<i>2</i>	<i>10</i>

The Viralkadai alavu of 7 $\frac{3}{4}$ is seen in 60% of affected cases. 7 $\frac{1}{2}$ viralkadai alavu is present in 30 % of affected cases.

ENNVAGAI THERVUGAL

The Siddha Diagnostic rule of eight is posted in the table

Ennvagai thervugal of the trials.

Table-18

<i>S.No</i>	<i>Ennvagai thervugal</i>	<i>n</i>	<i>Types</i>	<i>Cases affected</i>	
				<i>No of cases</i>	<i>% of cases</i>
<i>1.</i>	<i>Naadi</i>	<i>20</i>	<i>Iya Vali</i>	<i>5</i>	<i>25</i>
			<i>Azhal Iyam</i>	<i>8</i>	<i>40</i>
			<i>Vali Iyam</i>	<i>2</i>	<i>10</i>
			<i>Iya Azhal</i>	<i>5</i>	<i>25</i>
<i>2.</i>	<i>Sparisam</i>	<i>20</i>		<i>10</i>	<i>50</i>
<i>3.</i>	<i>Naa</i>	<i>20</i>		<i>11</i>	<i>55</i>
<i>4.</i>	<i>Niram</i>	<i>20</i>		<i>11</i>	<i>55</i>
<i>5.</i>	<i>Vizhi</i>	<i>20</i>		<i>11</i>	<i>55</i>
<i>6.</i>	<i>Malam</i>	<i>20</i>		<i>6</i>	<i>30</i>
<i>7.</i>	<i>Moothiram</i>	<i>20</i>		<i>20</i>	<i>100</i>
<i>8.</i>	<i>Mozhi</i>	<i>20</i>		<i>-</i>	<i>-</i>

The moothiram is affected in cent percent of cases. The indications of Naa, Niram and vizhi are affected 55% each. The malam indicates in 30% of cases.

CLINICAL FEATURES

Clinical features of the study trials

Table - 19

<i>S. No.</i>	<i>Clinical features</i>	<i>n</i>	<i>Affected cases</i>	
			<i>No of cases</i>	<i>% of cases</i>
<i>1.</i>	<i>Numbness in the foot</i>	<i>20</i>	<i>20</i>	<i>100</i>
<i>2.</i>	<i>Burning sensation</i>		<i>20</i>	<i>100</i>
<i>3.</i>	<i>Heaviness of the foot</i>		<i>19</i>	<i>95</i>
<i>4.</i>	<i>Pain in the foot</i>		<i>14</i>	<i>70</i>
<i>5.</i>	<i>Callus formation</i>		<i>13</i>	<i>65</i>
<i>6.</i>	<i>fissure</i>		<i>16</i>	<i>80</i>
<i>7.</i>	<i>Itching and oozing</i>		<i>16</i>	<i>80</i>
<i>8.</i>	<i>Erythematous</i>		<i>17</i>	<i>85</i>

Numbness and Burning sensation in the foot are observed in cent perent of the cases.80% of the cases are affected with fissure,Itching and symptoms. The oozing is observed in 80%of the cases.95% of the cases are having Heaviness of the foot .

Related Laboratory investigation

Table -20

S. No.	Laboratory investigation	Male n = 18		Female n= 2	
		No	%	No	%
1.	Hb	7	38.8	2	100
2.	Urine albumin	13	72.2	1	50
3.	Urine Sugar	4	22.2	1	50

Table -21

Significance of the Bio-chemical variable glucose and Hb

S. No.	Bio chemical	Sex	Mean of normal	Sample mean		S.D	Significance with normal	
							't'	Significace
1.	Hb	male	15mgms	18	12.6	0.95	10.718	Significant
		Female	13.25mgms	2	12.0	0	-	Not Significant
2.	Fasting sugar	both	90mgms%	20	192.1	58.2	7.845	Significant

The above table clearly shows that the study male subjects are having the low Hb level than the normal mean Hb level of 15mgms %. The difference of the Hb level is statistically Significant. The females are having only 12mgms% and the same is not significantly differed with normal mean of 13.25mgms%. The Fasting sugar of both the sexes is greater than the normal mean of 90mgms. The mean sugar of the study subjects 192.1 ± 58.2 mgm% is highly Significant with the normal fasting mean sugar 90 ± 10 mgms%.

DISCUSSION

*In Thanvanthri Vaithiyam, “ **Pathachakkaram**” is described under “Patha roga nithaanam”. The Name “Pathachakkaram” means - **A kind of festering sore in the foot.***

Patients with foot ulcer were interrogated thoroughly and their history, ailments characters of signs and symptoms were noted in materials and method.

The observed results and other Entities that have been studied are discussed under the following headings.

1. Age and Sex distribution

In this male were predominantly affected and the incidence is high in the age group above 30 years.

2. Family History

There is no specific relation with family history.

3. Personal Habits

High intake of sweets, fatty diet can induce this disease.

4. Residential area

There is no direct relationship with the residential area. Irrespective of their residing place, the food habit, will lead to the disease soon.

5. Paruvakalangal

There is no direct relationship with seasonal Variation.

6. History of Diabetes Mellitus

Direct relationship with Diabetes Mellitus

7. Improper Foot care

Predisposes the disease

8. History of Past and Present illness

A detailed history of all drugs used with in the previous 2 years and possible chemical exposure, Dietary habits, previous surgical procedure and alcohol intake, Leprosy, Syphilis should be evaluated.

Siddha parameters

Mukkutram

Vali, Azhal, and Iyam constitutes the mukkutrangal and the affected thodams are,

Derangement in Vali

Table – 22

<i>Types</i>	<i>Changes</i>	<i>Character</i>
<i>Piranan</i>	<i>Affected</i>	<i>Increased appetite</i>
<i>Abanan</i>	<i>Affected</i>	<i>Increased Urine output</i>
<i>Viyanan</i>	<i>Affected</i>	<i>Numbness, Burning, Sensation, pain, Heaviness in the foot.</i>
<i>Uthanan</i>	<i>Affected</i>	<i>Increased Thirst</i>
<i>Samanan</i>	<i>Affected</i>	<i>Increased appetite Increased Thirst</i>
<i>Nagan</i>	<i>Affected</i>	<i>cataract formation</i>
<i>Koorman</i>	<i>Affected</i>	<i>Increased Sleep</i>
<i>Kirukaran</i>	<i>Affected</i>	<i>Increased appetite</i>
<i>Thevathathan</i>	<i>Affected</i>	<i>Restlessness, Tiredness</i>
<i>Thenanjayan</i>	<i>Not affected</i>	

Derangement of Azhal

Table - 23

<i>Types</i>	<i>Changes</i>	<i>Character</i>
<i>Analpitham</i>	<i>Affected</i>	<i>Increased appetite</i>
<i>Prasagam</i>	<i>Affected</i>	<i>Ulcer in the fool</i>
<i>Ranjaga pitham</i>	<i>Affected</i>	<i>Fatigue</i>
<i>Alosagam</i>	<i>Affected</i>	<i>Cataract formation</i>
<i>Sathagam</i>	<i>Affected</i>	<i>Restricted movement</i>

Derangement of Iyam

Table - 24

<i>Types</i>	<i>Changes</i>	<i>Character</i>
<i>Avalambagam</i>	<i>Affected</i>	<i>Balancing function</i> <i>Affected</i>
<i>Kilethagam</i>	<i>Not Affected</i>	-
<i>Pothagan</i>	<i>Not Affected</i>	-
<i>Tharpagam</i>	<i>Not Affected</i>	-
<i>Santhigam</i>	<i>Affected</i>	<i>Restricted movement</i>

Udal Thaathukkal

Table - 25

<i>S.No</i>	<i>Types</i>	<i>Changes</i>	<i>Character</i>
<i>1</i>	<i>Saaram</i>	<i>Affected</i>	<i>Tiredness</i>
<i>2.</i>	<i>Senneer</i>	<i>Affected</i>	<i>Fatigue</i>
<i>3.</i>	<i>Oon</i>	<i>Affected</i>	<i>Ulcer in the foot</i>
<i>4.</i>	<i>Kozhuppu</i>	<i>Affected</i>	<i>Weight loss</i>
<i>5.</i>	<i>Enbu</i>	<i>Affected</i>	<i>Charcot joint, osteomyelitis</i>
<i>6.</i>	<i>Moolai</i>	<i>Affected</i>	<i>Non healing Ulcer</i>
<i>7.</i>	<i>Sukkilam</i>	<i>Affected</i>	<i>Loss of libido</i>

Inter predation of Envagai Thervugal

Among the envagai thervugal, meikuri, Niram, Moothiram, and naadi were affected and reflects the characteristic picture of “Pathachakkaram”

a. Meikuri

The changes of meikuri in this disease is, Numbness, Burning sensation, Heaviness in affected area, and Ulcer formation in the foot.

b. Niram

*The Niram shows the changes in Erythematous (or) Reddish
Ulcer in the affected area (Foot).*

c. Neerkuri, Neikuri References

Table - 26. Neerkuri

S. No	Types	Characters of urine	Patient state
1	Niram	Specific change in colour	Affected Clear nad White
2	Manam	Changes in smell	Affected Like honey
3	Edai	Changes in specific gravity	Affected Thick Consistency
4	Nurai	Abnormal frothy	Present
5	Enjal	Deposits	Affected Large quantity

Neikuri

The neikuri is aravil muthu, mellana parval

C. Naadi

The “Kai Naadi” – In patha chakkaram is “Azhal Iyam.”

*The other parameters of Envagai thervugal are explained
below as follows.*

Table - 26

S.No	Type	Changes	Characte1.
1.	Meikuri	Affected	Ulcer in the foot
2.	Niram	Affected	Erythematous ulcer in the foot
3.	Naa	Not affected	-
4.	Vizhi	Not affected	-
5.	Mozhi	Not affected	-
6.	Malam	Not Affected	-
7.	Moothiram	Affected	Increased urinary out put
8.	Kaikuri	Azhal Iyam	-

INTERPRETATION OF MODERN PARAMETERS

After examination of clinical features by Ennvagai Thervugal, the patient was subjected to laboratory investigations, which include haematological, urine and stool examination and specific examination like Doppler study of lower limb, Bio-Thesio meter, Podiascan.

Haematological examination shows increased blood glucose level.

Urine examinations show glucose.

Doppler study of lower limb shows Mild microangiopathies.

Bio-Thesio meter study show severe Neuropathy

Podiascan show high foot pressure

Highlights of the Dissertation Topic

Patha Chakkaram comes under the patha rogangal in Thanvanthri vaithiyam – II part.

According to Siddha Literatures, “Patha – Chakkaram” means - A -kind of festering sore in the foot the important and major aetiological factors of Patha Chakkaram is Madhu Megam (Diabetes mellitus) so, in this disorder all the mukkuttrangal, major subdivisions of vayu, and their function, and all the seven Udal kattugal are simultaneously affected.

The disease is characterized by the presence of Numbness of the foot, Burning sensation of the foot, heaviness of the foot, pain in the foot, followed by callus formation in the foot, fissure in the foot, itching, whoozing, and erythematous ulcer in the plantar aspect of the foot.

The underlying pathogenesis for the Pathachakkaram is the Peripheral Nerve damage resulting in increased foot iressure and its leading to (erythematous) ulcer in the plantar aspect of the foot as seen in “Diabetis Mellitus.”

CONCLUSION

The clinical study on Pathachakkaram mainly based on siddha diagnostic methods said by siddhars.

The study on Pathachakkaram was carried out in this dissertation giving importance to the changes in Udal Thathukkal, Uyir thathukkal etc.

The changes in the Udal Thathukkal and Uyir thathukkal were assessed by siddha parameters like Envagai thervugal, Poriyaal arithal, Pulanaal arithal, and Vinaathal and prognosis was assessed by Nei-kuri.

A parallel modern diagnosis was arrived through routine blood tests, Urine tests, Stool examination, Biothesio-meter and Doppler study.

The aetiological factors for PathaChakkaram are mainly due to altered food habits and improper life style and improper foot care. This is also stressed in modern aspects, Peripheral Neuropathy with foot ulcer.

Paraesthesia is a frequent feature in peripheral neuropathy. These are usually tingling in nature, but may involve thermal sensation, most often with a burning quality.

The neuropathy causes, increased foot pressure, and callous formation, fissure in the callus, itching and whoozing from the fissure, and then develops into ulcer the ulcer, become reddish in appearance.

The author has seen various types of Neuropathic foot ulcers such as

Diabetic - *reddish and punched out ulcer*

Leprosy - *pale colour – dry ulcer*

Syphilis - *Washleather slough appearance*

Out of these the Diabetic foot ulcer which was taken as dissertation topic has shown typical erythematous appearance,

Which coincides with symptoms in Thanvanthri vaithyam for “Patha Chakkaram.”

So, the study on Pathachakkaram concludes that,

Pathachakkaram, is an Neuropathic foot ulcer as a complication of Diabetes mellitus.

The Pathogenesis of Patha Chakkaram involves the vitiation of Azhal, Vali, Iyam in various degrees.

The signs of the disease are clearly depicted by the Udal Thathukkal.

It is essential to know the Pathogenesis of the disease for proper diagnosis and treatment, to save the leg from amputation and also to advice the patient to control the blood sugar level, proper foot care like callus removal, eradication and redistribution of the weight bearing forces, and prevent infection of foot ulcers.

P.G. -NOI NAADAL DEPARTMENT
GOVT. SIDDHA MEDICAL COLLEGE, PALAYAMKOTTAI.
A Study to Diagnose Pathachakkaram through Siddha
Diagnostic Methodology
SELECTION PROFORMA

1.O.P.No _____ 2. I.P. NO _____ 3. Bed No: _____ 4. S. No: _____ 5.Date: _____

6. Name: _____ 7. Age (Years):

--	--

 8. Sex:

M	F
---	---

9. Occupation: _____ 10. Income: _____/month

11. Address:

.....
.....
.....

12. Complaints and duration:

.....
.....
.....

13. History of present illness:

.....
.....
.....

14. Past history:

.....
.....
.....

15. Family History:

.....
.....
.....

<i>Habits</i>	<i>1.Yes</i>	<i>2.No</i>
16. Betelnut chewer :	<input type="checkbox"/>	<input type="checkbox"/> _____
17. Tea :	<input type="checkbox"/>	<input type="checkbox"/> _____
18. Coffee :	<input type="checkbox"/>	<input type="checkbox"/> _____
19. Tobacco chewer :	<input type="checkbox"/>	<input type="checkbox"/> _____
20. Smoking :	<input type="checkbox"/>	<input type="checkbox"/> _____
21. Alcohol :	<input type="checkbox"/>	<input type="checkbox"/> _____
22. Food habits : V <input type="checkbox"/> NV <input type="checkbox"/> M <input type="checkbox"/>		_____

GENERAL ETIOLOGY FOR PATHACHAKKARAM

	<i>1.Yes</i>	<i>2.No</i>
23. High fatty diet	<input type="checkbox"/>	<input type="checkbox"/> _____
24. Heavy intake of sweets	<input type="checkbox"/>	<input type="checkbox"/> _____
25. Heavy intake of non-vegetarian	<input type="checkbox"/>	<input type="checkbox"/> _____
26. Obesity	<input type="checkbox"/>	<input type="checkbox"/> _____
27. Increased intake of alcohol	<input type="checkbox"/>	<input type="checkbox"/> _____
28. Indulging excessively in sexual act	<input type="checkbox"/>	<input type="checkbox"/> _____
29. Indulging sexual act with diseased women	<input type="checkbox"/>	<input type="checkbox"/> _____
30. Alterations in sleeping rhythm	<input type="checkbox"/>	<input type="checkbox"/> _____
31. Fickleness of mind	<input type="checkbox"/>	<input type="checkbox"/> _____
32. Evidence of neuropathy	<input type="checkbox"/>	<input type="checkbox"/> _____
33. Callus at pressure points	<input type="checkbox"/>	<input type="checkbox"/> _____

GENERAL EXAMINATION

34. Weight(kg)

--	--	--

35. Temperature(°F)

--	--	--

36. Pulse rate/minute

--	--	--

37. Heart rate/minute

--	--	--

38. Respiratory rate/minute

--	--	--

39. Blood pressure

--	--	--

mm/Hg

1.Yes**2.No**

40. Pallor

--

--

41. Jaundice

--

--

42. Cyanosis

--

--

43. Lymphadenopathy

--

--

44. Pedal edema

--

--

45. Clubbing

--

--

46. Jugular venous pulsation

--

--

VITAL ORGANS EXAMINATION**1.Normal****2.Affected**

47. Heart

--

--

48. Lungs

--

--

49. Brain

--

--

50. Liver

--

--

51. Kidney

--

--

52. Spleen

--

--

53. Stomach

--

--

SIDDHA SYSTEM OF EXAMINATION
ENNVAGAI THERVUKAL

NAA

54. *Maa Padinthiruthal* 1. *Present* ☐ 2. *Absent* ☐

55. *Niram*

1. *Karuppu* ☐ 2. *Manjal* ☐ 3. *Velluppu* ☐

56. *Suvai*

1. *Pulippu* ☐ 2. *Kaippu* ☐ 3. *Inippu* ☐

57. *Vedippu*

1. *Present* ☐ 2. *Absent* ☐

58. *Vai neer oorai*

1. *Normal* ☐ 2. *Increased* ☐ 3. *Reduced* ☐

59. NIRAM

1. *Karuppu* ☐ 2. *Manjal* ☐ 3. *Velluppu* ☐

60. MOZHI

1. *Sama oli* ☐ 2. *Urattha oli* ☐ 3. *Thazhntha oli* ☐

VIZHI

61. *Niram*

1. *Karuppu* ☐ 2. *Manjal* ☐

3. *Sivappu* ☐ 4. *Velluppu* ☐

62. *Kanneer*

1. *Present* ☐ 2. *Absent* ☐

63. *Erichchal*

1. *Present* ☐ 2. *Absent* ☐

64. *Peelai seruthal*

1. *Present* ☐ 2. *Absent* ☐

MEI KURI

65.Veppam

1. Mitham

☐

2. Migu

☐

3. Thatpam

☐

66.Viyarvai

1. Normal

☐

2. Increased

☐

3. Reduced

☐

67.Thodu vali

1. Present

☐

2. Absent

☐**MALAM**

68.Niram

1. Karuppu

☐

2. Manjal

☐

3. Sivappu

☐

4. Velluppu

☐

69.Sikkal

1. Present

☐

2. Absent

☐

70.Sirutthal

1. Present

☐

2. Absent

☐

71.Kalichchal

1. Present

☐

2. Absent

☐

72.Seetham

1. Present

☐

2. Absent

☐

73.Vemmai

1. Present

☐

2. Absent

☐**MOOTHIRAM****NEER KURI**

74.Niram

1. Venmai

☐

2. Manjal

☐

3. Crystal clear

☐

75.Manam

1. Present

☐

2. Absent

☐

76.Nurai

1. Nil ☐ 2.Increased ☐ 3. Reduced ☐

77.Edai(Ganam)

1. Normal ☐ 2. Increased ☐ 3. Reduced ☐

78.Enjal(Alavu)

1. Normal ☐ 2. Increased ☐ 3. Reduced ☐

79.NEI KURI

1. Aravam ☐ 2. Mothiram ☐

3. Muthu ☐ 4. Aravil Mothiram ☐

5. Aravil Muthu ☐ 6. Mothirathil Aravam ☐

7. Mothirathil Muthu ☐ 8. Muthil Aravam ☐

9. Muthil Mothiram ☐ 10. Asathiyam ☐

11. Mellena paraval ☐

NAADI(KAI KURI)

I. Naadi Nithanam

80. Kaalam

1. Kaarkaalam ☐ 2. Koothirkaalam ☐

3. Munpanikaalam ☐ 4. Pinpanikaalam ☐

5. Ilavenirkaalam ☐ 6. Muthuvenirkaalam ☐

81. Desam

1. Kulir ☐ 2. Veppam ☐

82. Vayathu

1. 1-33yrs ☐ 2.34-66yrs ☐

3. 67-100yrs ☐

83. Udal Vanmai

1. Iyalbu ☐ 2. Valivu ☐ 3. Melivu ☐

84. *Vanmai*

1. *Vanmai*

☐

2. *Menmai*

☐

85. *Panbu*

1. *Thannadai*

☐

2. *Puranadai*

☐

3. *Illaitthal*

☐

4. *Kathithal*

☐

5. *Kuthithal*

☐

6. *Thullal*

☐

7. *Azhutthal*

☐

8. *Padutthal*

☐

9. *Kalatthal*

☐

10. *Munnokku*

☐

11. *Pinnokku*

☐

12. *Suzhalal*

☐

13. *Pakkanokku*

☐

86. *Naadi nadai*

1. *Vali*

☐

2. *Azhal*

☐

3. *Iyam*

☐

4. *Vali Azhal*

☐

5. *Vali Iyam*

☐

6. *Azhal Vali*

☐

7. *Azhal Iyam*

☐

8. *Iya vali*

☐

9. *Iya Azhal*

☐

87. **MANIKKADAI NOOL (Viral Kadai Alavu)**

IYMPORIGAL / IYMPULANGAL

1. Normal

2. Affected

88. *Mei*

☐☐

89. *Vaai*

☐☐

90. *Kan*

☐☐

91. *Mookku*

☐☐

92. *Sevi*

☐☐

KANMENTHIRIYANGAL / KANMAVIDAYANGAL

	1.Normal	2.Affected
93.Kai	<input type="checkbox"/>	<input type="checkbox"/> _____
94.Kaal	<input type="checkbox"/>	<input type="checkbox"/> _____
95.Vaai	<input type="checkbox"/>	<input type="checkbox"/> _____
96.Eruvaai	<input type="checkbox"/>	<input type="checkbox"/> _____
97.Karuvaai	<input type="checkbox"/>	<input type="checkbox"/> _____

98. YAAKAI

1.Vali	<input type="checkbox"/>	2.Azhal	<input type="checkbox"/>	3.Iyam	<input type="checkbox"/>
4.Vali Azhal	<input type="checkbox"/>	5.Vali Iyam	<input type="checkbox"/>	6.Azhal Vali	<input type="checkbox"/>
7.Azhal Iyam	<input type="checkbox"/>	8.Iya Vali	<input type="checkbox"/>	9.Iya Azhal	<input type="checkbox"/>

99.GUNAM

1.Sathuva Gunam	<input type="checkbox"/>	2.. Raso Gunam	<input type="checkbox"/>	3. Thamo Gunam	<input type="checkbox"/>
-----------------	--------------------------	----------------	--------------------------	----------------	--------------------------

UYIR THATHUKKAL**I. Vali**

	1. Normal	2. Affected
100. Uyirkkaal (Praanan)	<input type="checkbox"/>	<input type="checkbox"/> _____
101. Keelnokkukkaal (Abaanan)	<input type="checkbox"/>	<input type="checkbox"/> _____
102. Paravukaal (Viyaanan)	<input type="checkbox"/>	<input type="checkbox"/> _____
103. Melnokkukkaal (Udhaanan)	<input type="checkbox"/>	<input type="checkbox"/> _____
104. Nadukkaal (Samaanan)	<input type="checkbox"/>	<input type="checkbox"/> _____
105. VaanthikKaal (Naahan)	<input type="checkbox"/>	<input type="checkbox"/> _____
106. Vizhikkaal (Koorman)	<input type="checkbox"/>	<input type="checkbox"/> _____
107.Thummikkaal (Kirukaran)	<input type="checkbox"/>	<input type="checkbox"/> _____
108. Kottavikkaal (Devathathan)	<input type="checkbox"/>	<input type="checkbox"/> _____
109. Veengukkaal (Dhananjeyan)	<input type="checkbox"/>	<input type="checkbox"/> _____

II. Azhal

	<i>1. Normal</i>	<i>2. Affected</i>
110.Aakkanal (<i>Anala pitham</i>)	<input type="checkbox"/>	<input type="checkbox"/> _____
111.Ollolithe (Prasaka pitham)	<input type="checkbox"/>	<input type="checkbox"/> _____
112.Vannaeri (<i>Ranjaka pitham</i>)	<input type="checkbox"/>	<input type="checkbox"/> _____
113.Nokkazhal (<i>Aalosaka pitham</i>)	<input type="checkbox"/>	<input type="checkbox"/> _____
114.Aatralangi (<i>Saathaka pitham</i>)	<input type="checkbox"/>	<input type="checkbox"/> _____

III. Iyam

	<i>1. Normal</i>	<i>2. Affected</i>
115.Aliiyam (<i>Avalambagam</i>)	<input type="checkbox"/>	<input type="checkbox"/> _____
116.Neerppiiyam (<i>Kilethagam</i>)	<input type="checkbox"/>	<input type="checkbox"/> _____
117.Suvaikaaniyam (<i>Pothagam</i>)	<input type="checkbox"/>	<input type="checkbox"/> _____
118.Niraivuiyam (<i>Tharpagam</i>)	<input type="checkbox"/>	<input type="checkbox"/> _____
119.Ondriiyam (<i>Santhigam</i>)	<input type="checkbox"/>	<input type="checkbox"/> _____

UDAL THATHUKKAL

	<i>1. Normal</i>	<i>2. Affected</i>
120.Saaram	<input type="checkbox"/>	<input type="checkbox"/> _____
121.Senneer	<input type="checkbox"/>	<input type="checkbox"/> _____
122.Oon	<input type="checkbox"/>	<input type="checkbox"/> _____
123.Kozhuppu	<input type="checkbox"/>	<input type="checkbox"/> _____
124.Enbu	<input type="checkbox"/>	<input type="checkbox"/> _____
125.Moolai	<input type="checkbox"/>	<input type="checkbox"/> _____
126.Suronitham/ Sukkilam	<input type="checkbox"/>	<input type="checkbox"/> _____

MUKKUTRA MIGU GUNAM

I. Vali Migu Gunam

1. Present

2. Absent

127.Emaciation

☐☐

128.Blackish colouration of the body

☐☐

129.Desire to take hot food

☐☐

130.Tremors

☐☐

131.Abdominal distension

☐☐

132.Insomnia

☐☐

133.Weakness

☐☐

134.Weakness of sense organs

☐☐

135.Giddiness

☐☐

136.Sluggishness

☐☐

137.Constipation

☐☐

II. Azhal Migu Gunam

1. Present

2. Absent

138.Yellowish discolouration of the skin

☐☐

139.Yellowish discolouration of the eye

☐☐

140.Yellowish discolouration of urine

☐☐

141.Yellowish discolouration of faeces

☐☐

142.Increased appetite

☐☐

143.Burning sensation in the body

☐☐

144.Insomnia

☐☐

III. Iyam Migu Gunam

1. Present

2. Absent

145.Excessive salivation

☐☐

146.Eraippu (dyspnoea)

☐☐

147.Heaviness of the body

☐☐

148.Whiteness of the body

☐☐

- | | | |
|-----------------------------------|--------------------------|--------------------------|
| 149. <i>Chillness of the body</i> | <input type="checkbox"/> | <input type="checkbox"/> |
| 150. <i>Reduced appetite</i> | <input type="checkbox"/> | <input type="checkbox"/> |
| 151. <i>Cough</i> | <input type="checkbox"/> | <input type="checkbox"/> |
| 152. <i>Increased sleep</i> | <input type="checkbox"/> | <input type="checkbox"/> |
| 153. <i>Sluggishness</i> | <input type="checkbox"/> | <input type="checkbox"/> |

154. NOI UTRA KAALAM

- | | | | |
|--------------------------|--------------------------|----------------------------|--------------------------|
| 1. <i>Kaarkaalam</i> | <input type="checkbox"/> | 2. <i>Koothirkaalam</i> | <input type="checkbox"/> |
| 3. <i>Munpanikaalam</i> | <input type="checkbox"/> | 4. <i>Pinpanikaalam</i> | <input type="checkbox"/> |
| 5. <i>Ilavenirkaalam</i> | <input type="checkbox"/> | 6. <i>Muthuvenirkaalam</i> | <input type="checkbox"/> |

155. NOI UTRA NILAM

- | | | | |
|--------------------|--------------------------|-------------------|--------------------------|
| 1. <i>Kurinji</i> | <input type="checkbox"/> | 2. <i>Mullai</i> | <input type="checkbox"/> |
| 3. <i>Marutham</i> | <input type="checkbox"/> | 4. <i>Neithal</i> | <input type="checkbox"/> |
| 5. <i>Paalai</i> | <input type="checkbox"/> | | |

156. *Date of Birth*

157. *Time of Birth*

158. *Place of Birth*

159.NATCHATHIRAM

1.Aswini	<input type="checkbox"/>	2.Barani	<input type="checkbox"/>	3.Karthikai	<input type="checkbox"/>
4.Rohini	<input type="checkbox"/>	5.Mirugaseeridam	<input type="checkbox"/>	6.Thiruvathirai	<input type="checkbox"/>
7.Punarpooam	<input type="checkbox"/>	8.Poosam	<input type="checkbox"/>	9.Aayilyam	<input type="checkbox"/>
10.Makam	<input type="checkbox"/>	11.Pooram	<input type="checkbox"/>	12.Utthiram	<input type="checkbox"/>
13.Astham	<input type="checkbox"/>	14.Chithirai	<input type="checkbox"/>	15.Swathi	<input type="checkbox"/>
16.Visakam	<input type="checkbox"/>	17.Anusam	<input type="checkbox"/>	18.Kettai	<input type="checkbox"/>
19.Moolam	<input type="checkbox"/>	20.Pooradam	<input type="checkbox"/>	21.Utthiradam	<input type="checkbox"/>
22.Thiruvonam	<input type="checkbox"/>	23.Avittam	<input type="checkbox"/>	24.Sadayam	<input type="checkbox"/>
25.Poorattathi	<input type="checkbox"/>	26.Utthirattathi	<input type="checkbox"/>	27.Revathi	<input type="checkbox"/>
00.Not known	<input type="checkbox"/>				

160.RAASI

1.Mesam	<input type="checkbox"/>	2.Rishabam	<input type="checkbox"/>	3.Midhunam	<input type="checkbox"/>
4.Kadakam	<input type="checkbox"/>	5.Simmam	<input type="checkbox"/>	6.Kanni	<input type="checkbox"/>
7.Thulam	<input type="checkbox"/>	8.Viruchiham	<input type="checkbox"/>	9.Dhanusu	<input type="checkbox"/>
10.Maharam	<input type="checkbox"/>	11.Kumbam	<input type="checkbox"/>	12.Meenam	<input type="checkbox"/>
00.Not known	<input type="checkbox"/>				

EXAMINATION OF ULCER:**161.Inspection:**

1. Size :

.....

2. Shape :

.....

3. Colour:

4. *Number:*
.....

5. *Position:*
.....

6. *Edge :*
.....

7. *Floor :*
.....

8. *Discharge :*
.....

9. *Surrounding area :*
.....

162.Palpation:

1. *Tenderness :*

2. *Depth :*

3. *Relations with the deeper structure:*

4. *Surrounding skin:*

INVESTIGATION**BLOOD**

163. TC (Cells/cumm) :

164. DC (%) : 1.P 2.L 3.E
4.B 5.M

165. Hb (gms%) :

166. E.S.R. (mm/hr) : 1. 1/2hr 2. 1hr

167. Blood Sugar (F) (mgs%) :

URINE

168. Albumin : 0. Nil 1. Trace 2. +
3. ++ 4. +++

169. Sugar : 0. Nil 1. Trace 2. +
3. ++ 4. +++

Deposits

	1. Yes	2. No
170. Pus cells	<input type="text"/>	<input type="text"/>
171. Epithelial cells	<input type="text"/>	<input type="text"/>
172. RBCs	<input type="text"/>	<input type="text"/>
173. Crystals	<input type="text"/>	<input type="text"/>

MOTION TEST

	1. Yes	2. No
174. Ova	<input type="text"/>	<input type="text"/> _____
175. Cyst	<input type="text"/>	<input type="text"/> _____
176. Occult blood	<input type="text"/>	<input type="text"/> _____

177.Biothesio - Meter:

.....

.....

178.Doppler study:

.....

.....

CLINICAL SYMPTOMS OF PATHACHAKKARAM:

	<i>1. Present</i>	<i>2. Absent</i>
<i>179. Numbness of the foot</i>	<input type="checkbox"/>	<input type="checkbox"/> _____
<i>180. Burning sensation of the foot</i>	<input type="checkbox"/>	<input type="checkbox"/> _____
<i>181. Heaviness of the foot</i>	<input type="checkbox"/>	<input type="checkbox"/> _____
<i>182. Pain in the foot</i>	<input type="checkbox"/>	<input type="checkbox"/> _____
<i>183. Callus formation in the foot</i>	<input type="checkbox"/>	<input type="checkbox"/> _____
<i>184. Fissure In the Callus</i>	<input type="checkbox"/>	<input type="checkbox"/> _____
<i>185. Itching</i>	<input type="checkbox"/>	<input type="checkbox"/> _____
<i>186. Whoozing in the ulcer</i>	<input type="checkbox"/>	<input type="checkbox"/> _____
<i>187. Erythematous Ulcer in the foot</i>	<input type="checkbox"/>	<input type="checkbox"/> _____

PROTOCOL

A STUDY TO DIAGNOSE “PATHACHAKKARAM“ THROUGH SIDDHA DIAGNOSTIC METHODOLOGY

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1.BACKGROUND

PATHACHAKKARAM

It denotes the chronic ulceration of the Foot. The chronic ulceration is caused by the damage of peripheral nerves in the Foot, as a complication of Diabetes mellitus.

In Thanvanthri vaithyam explained. “Pathachakkaram” as mentioned below.

“காணுதற்கு மரிய திமி ரெரிப்பு முண்டாய்க்
கணத்து வலித் திடுகிலிவையுள் ளழுவாதந்தான்
சேனெரியு மக்கி விதர் போல்த தோன்றித்
தினவாகி நீர் பாய்ந்து செம்புண்ணாகித்
தோனு மெனிலிவை பாத்ச சக்கரத்தின்
தொகுதியேனவே முனிவன் சொன்னவாறே”

In pathachakkarm vali humour is altered. The following symptoms will occur. Numbness of the Foot, Burning sensation of the Foot, weightness of the Foot. Followed by callus Formation and itching of the Foot then Ulceration of Foot.

2.AIM

a) PRIMARY AIM :-

To diagnose “PATHACHAKKARAM” through Envagai thervu and manikadai nool.

b) SECONDARY AIM:-

To correlate “PATHACHAKKARAM” With Nilam, Kalam and Sothidam.

3.POPULATION AND SAMPLE

PATHACHAKKARA M (as explained above under the song)
Patient satisfying the inclusion and exclusion criteria mentioned below.

The samples of pathachakkaram patient and selected from O.P and I.P. Departments of Govt, Siddha medical College, Palayamkottai under the guidance of faculties, Head of the Department of post graduate - NOI Naadal Department.

4.SAMPLE SIZE

A sample size of 20 patients will be taken for detailed study

5.INCLUSION CRITERIA

- 1.Age – above 15 years.
- 2.Complaints - more than 6 months.
- 3.Willing to give blood and urine specimen for Investigations whenever required.

6. EXCLUSION CRITERIA:-

1. Tuberculoid ulcer.
2. vericose ulcer.
3. Arterial ulcer.
- 4.Lepromatic ulcer.

7. CONDUCT :-

PATHACHAKKARAM patients Satisfying the inclusion and exclusion criteria will be included in this study.
Siddha diagnostic Procedure such as Envagai thervu, manikadai nool, Nilam, Kaalam and sothidam of the patients will be noted.

8. FORM

Form diagnostic proforma for pathachakkaram.

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